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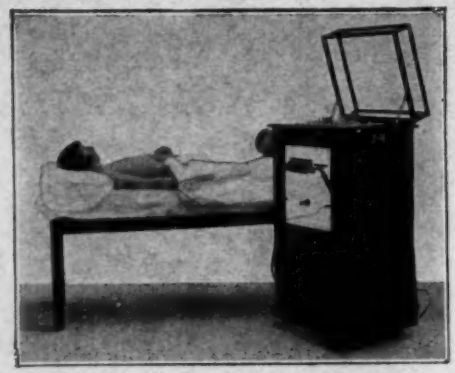

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The American Journal of Obstetrics and Gynecology

VOL. V ST. LOUIS, APRIL, 1923 No. 4

Original Communications

SARCOMA OF THE UTERUS*

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From the Section on Surgery, Mayo Clinic

SARCOMA, as defined by MacCallum, is a tumor arising from connective tissue and retaining most of the characteristics of connective tissue, but endowed with the new power of invading and actively destroying adjacent structures and of forming colonies of its own tissue in distant organs.

REVIEW OF LITERATURE

In 1860, Mayer described sarcoma of the uterus. Two years later Virchow called attention to the condition. In 1867 Veit published an article on sarcoma of the cervix uteri. In spite of these early articles and the frequent reference to the condition by European writers, comparatively few cases were reported in this country until recent years. In 1894 Williams published an excellent monograph on the histology and histogenesis of sarcoma of the uterus with a review of the literature. In 1901 Knott reviewed the histories of 118 cases collected from the literature during the preceding ten years. In 1905 Grad directed attention to the benefits to be derived from radiotherapy. In 1907, 1908, and 1909 Taylor reported several cases. Valuable papers on the subject have been published in recent years by Proper and Simpson, Fullerton, Warner, Miller, Maroney, Hellier, and others.

It is often difficult to differentiate simple degenerating septic

*Presented before the New York Academy of Medicine, November 29, 1922.

NOTE: The Editor accepts no responsibility for the views and statements of authors as published in their "Original Communications."

polypus, myoma, and true sarcoma, not only in the gross specimen, but even after microscopic study. I am sure that if complete records were obtainable it would be found that many women had died as the result of recurrent pelvic tumors following myomectomies and semi-radical operations for tumors that were diagnosed benign. Williams reported a case in which four polypi were removed from the uterus in a period of five years; the first was considered benign, the second and third, small round-cell sarcoma, and the fourth, benign. The subsequent history of the case clearly illustrated that no malignancy existed as there was no sign of recurrence in three years.

HISTOLOGY AND PATHOLOGY

Many malignant tumors are composed of irregular and nondifferentiated cells, making it difficult to determine their origin. This has led to much confusion in the nomenclature and to the introduction of a great many unnecessary names. There is no doubt that many pathologic conditions now classified as sarcoma will be classified as separate types of malignancy as new light is thrown on their origin. The simplest classification is one based on the character of the cells and their intracellular substance. The commonest forms are: round-cell sarcoma (large or small), spindle-cell sarcoma, giant-cell sarcoma, and mixed-cell sarcoma.

The spindle-cell sarcoma is the most common type of sarcoma in the uterus; it usually develops in a fibromyoma and is often classified as myosarcoma or fibrosarcoma, depending on the type of differentiated connective tissue it most resembles. Sarcoma arising from the mucosa of the uterus may be spindle-cell, round-cell, mixed-cell, or giant-cell, and the more rare forms such as lymphosarcoma, angioblastic sarcoma, chondrosarcoma, osteosarcoma, myxosarcoma, ganglioma, and so forth, have been described. Certain authors speak of decidual-cell sarcoma, but I do not believe that this type of tumor should be included among tumors of the uterus as it probably has its origin in embryonic tissue, although as Ewing suggests, changes due to menstruation may account for the type of cell found. It is an extremely malignant type of growth. However, local conditions, resistance of the host, and so forth, will necessarily influence the pathologic picture.

Sarcomas originating in the mucosa are usually polypoid and because of interference with their circulation are likely to become edematous, and often necrotic. They are comparatively rare. Only one case occurred in the present series (1906 to 1920), but one other case was treated in the clinic about nine months ago. Spiegelberg called attention to the "grape-like" appearance of these growths and to their malignant characteristics. Certain writers designate some of them as myxosarcoma and others speak of them as round or spindle-

cell sarcoma with myxomatous degeneration. They usually occur in young patients; one of the cases in the series was complicated with pregnancy, but in some of the reported cases the patients were past the menopause, as in the case reported by Byford. Besides the polypoid form, diffuse sarcomas occasionally develop in the endometrium. They probably start from a single polypus with diffuse involvement of mucous membrane before invading the myometrium. In some of the reported cases the cervical canal was obstructed, causing reten-

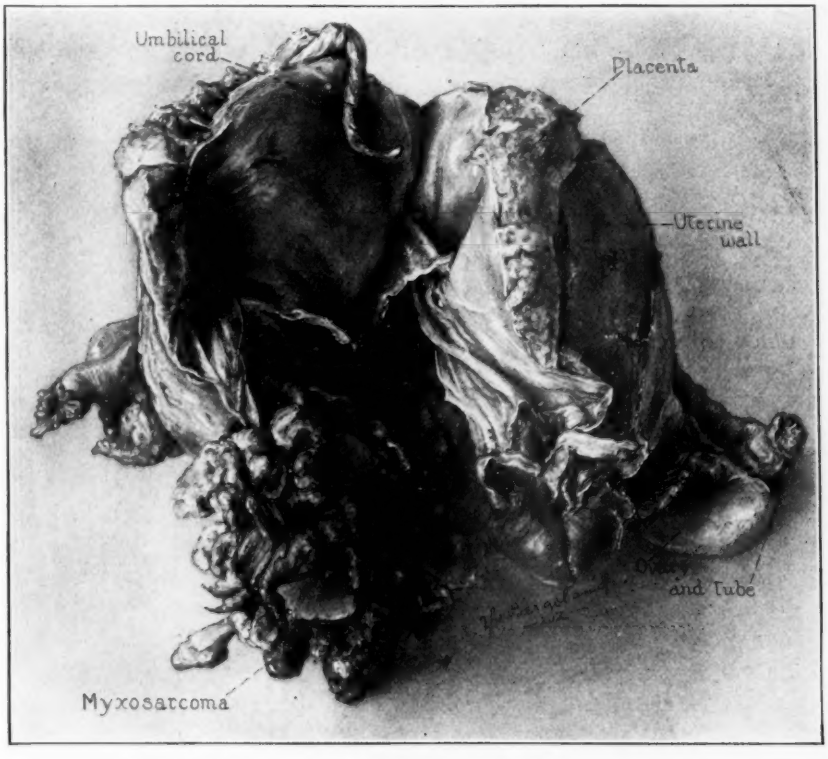

Fig. 1.—Myxosarcoma of the pelvis complicated by pregnancy.

tion of blood, mucus and serum, which later became infected and caused pyometra.

Sarcomas of the uterine mucosa are not encapsulated. As a rule they are polypoid in appearance, and for that reason, all tissue removed from so-called polypoid endometritis cases should be submitted to careful microscopic examination. There is little doubt that the malignant process begins in the majority of these cases in ulcerating polypi. Sarcomas of the mucosa as a rule are much more malignant than myosarcomas. The local growth is more malignant, with early infiltration of the perimetric tissues and metastasis to other organs, especially the lungs and liver, and more rarely to the iliac glands.

In the early stage of their development they give the classical symptoms of endometritis. Later they may protrude from the cervix and invade the vaginal wall.

Sarcomas as a group are more rapid in their growth than carcinomas; they are more vascular and as a result softer and more friable; but the fibrosarcomas and myosarcomas, the commonest sarcomas found in the uterus, are comparatively solid growths, but may have hemorrhagic areas or necrosis, as the result of interference with the circulation. Relatively, they metastasize later, and if the local growth can be completely removed the prospect for cure is better than in cases of epithelioma or adenocarcinoma. The small, round-cell sarcoma is the most malignant type and in many cases it

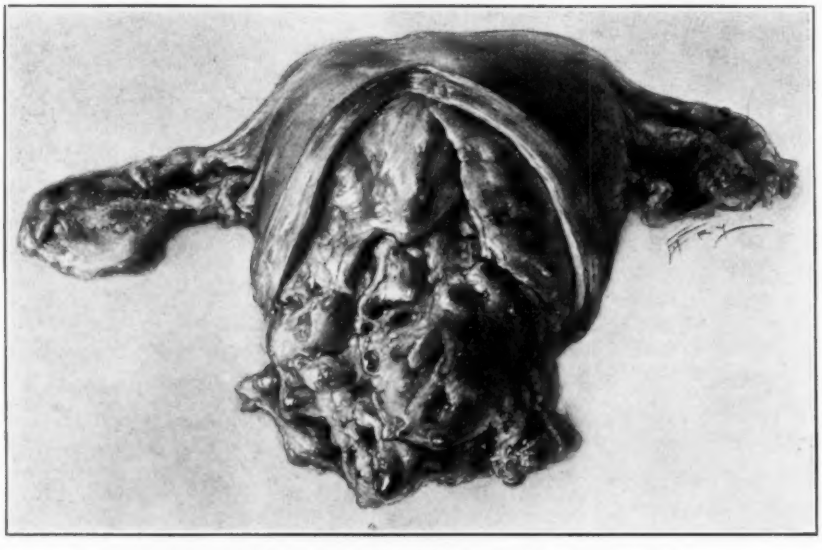

Fig. 2.—Sarcoma of the uterus.

leads to a fatal result in a few months. The giant-cell tumors are the least malignant and rarely, if ever, metastasize. With any type of malignant tumor, if the parametrium is invaded, extension is rapid. It has been estimated by several authors that sarcoma of the uterus occurs in from one in forty to one in fifty cases of carcinoma. In my experience, the incidence has been less. There is no doubt that many of the cases classified as carcinoma of the body of the uterus, or recurrent myoma, by the earlier authors should have been classified as sarcoma. (Figs. 1 to 6.)

Sarcomas may occur in a preëxisting fibromyoma, in the uterine wall (body or cervix), or in the endometrium. As observed in the Clinic they have been much more common in preëxisting fibromyomas. Growths originating in fibromyomas, or in the uterine wall proper,

may be either encapsulated or diffuse. They are spoken of as subserous, interstitial or submucous, according to their location, but in advanced cases it is difficult to determine where they originated. Because of the tendency for such tumors to grow towards the uterine cavity, many are classified as endometrial growths, whereas they probably started in the interstitial tissue of the uterus. It is still a disputed point whether malignant myomas are malignant from the beginning, or whether they represent a malignant change in a tumor that was originally benign. Bland-Sutton believes that such tumors are malignant from the beginning. Many cases are reported in which the patient or her physician had known that a tumor was present for many years preceding a sudden enlargement and definite symp-

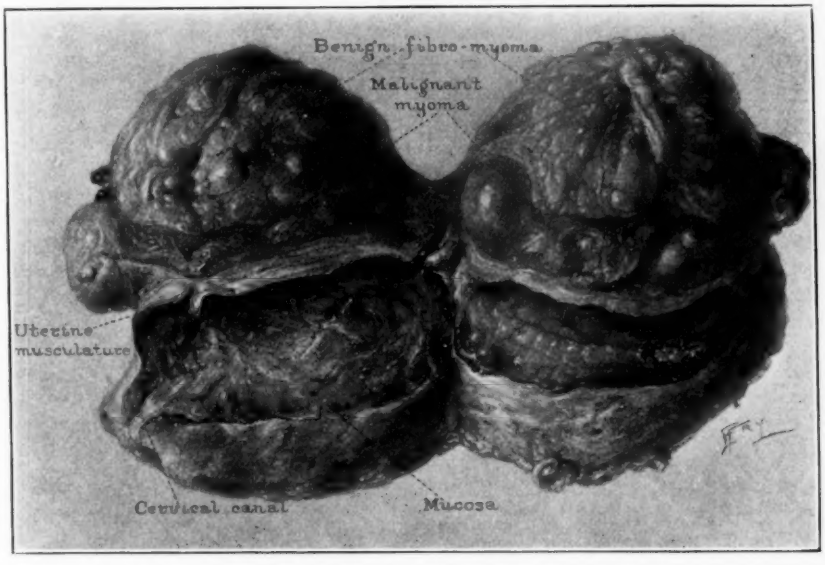

Fig. 3.—Early sarcoma. Uterus with single interstitial fibromyomatous tumor 8 cm. in diameter. The central portion of the tumor has the white trabeculated appearance of a benign fibromyoma. The entire peripheral portion is yellow and the surface smooth cut, similar to malignant myomatous tissue. There is a distinct line of demarcation between it and the central benign portion.

toms of a malignant change. Some will contend that this represents simply the development of a sarcoma in a uterus in which there was a preëxisting fibroid. Others will describe it as a malignant degeneration or change in a fibroid. There is no doubt that it will be a difficult task in most cases to determine just where a given tumor commenced to grow. I believe a sarcoma may develop in a fibromyoma and also, although more rarely, in some other part of the connective or myogenic tissue of the uterus itself, and in the stroma of the endometrium. In the fifty cases here reviewed the condition was recognized as beginning in, and in most cases still confined to, a single fibromyoma.

Multiple malignant growths of the uterus have been described by various writers; in some cases two or more distinct sarcomas have been present. In other cases, sarcoma and carcinoma have been diagnosed; such cases have been reported by Virchow, Gusserow, Klebs, Spencer, and others, and one such case occurred in my series. Carcinosarcomas or single growths with both carcinomatous and sarcomatous areas in them have been described. There is no doubt that, as Ewing suggests, many of the reported cases were either sarcomas or carcinomas of the endometrium complicated by changes due to infection, but the possibility must be admitted of the two types of tumors being independent in the beginning, and of one invading the other.

The pathologic aspect of sarcoma of the uterus is very complex. Different portions of the same tumor often show different types of

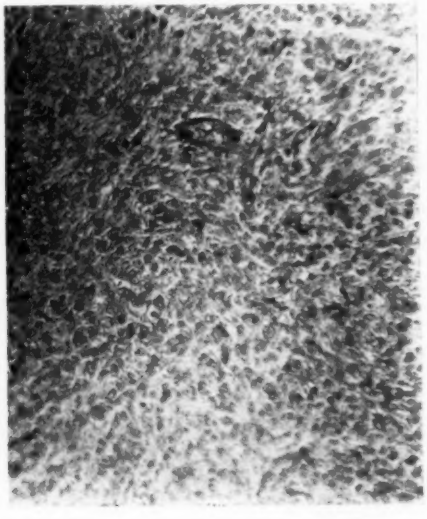

Fig. 4.—(A384667). Myxosarcoma of the pelvis (x50).

cells and arrangement of blood vessels; furthermore infection is commonly superimposed, and the resulting necrosis and lymphocytic infiltration markedly change both gross and microscopic pictures. It is not my intention to discuss this phase of the question in detail, as pathologists are not all in accord, not only as to the origin of some of these tumors, but also with regard to their degree of malignancy.

FIBROMYOMAS AND MALIGNANCY

In recent years many statistical reports have been published on the relative frequency of sarcoma in uterine fibromyomas, or the relative frequency of sarcomatous fibroids to fibromyomas. Such findings are far from uniform. Certain observers estimate the frequency of malignant change to be as high as 10 per cent, while others find it as low

as 0.4 per cent. This lack of uniformity no doubt may be attributed to the lack of a standard of malignancy, one surgeon or pathologist including cases that are not considered malignant by another.

In considering this phase of the subject, Ewing says, "These observations show that ordinary myomas vary in structure in different portions, and probably at different periods, and they seem to justify the suspicion with which the gynecologist regards the entire group. But it must be considered that these suspicious changes may not always be progressive, but may signify merely a temporary or local acceleration of growth which may subside or even regress. They do not seem to justify their designation as sarcomatous transformations for which much more extensively altered areas, or even general metastasis might well be demanded. Sarcomatous tendencies and precancerous changes do not constitute real sarcoma or cancer."

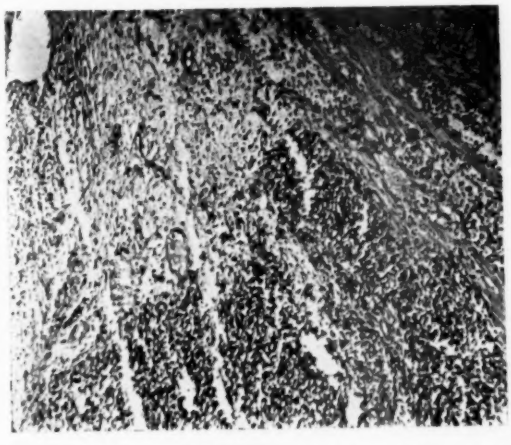

Fig. 5.—(A384667). Myxosarcoma of the pelvis. (x100).

It has long been recognized that mitotic figures are commonly found in fibroids undergoing sarcomatous change. In 1920 Evans reviewed seventy-two cases diagnosed sarcoma and cellular fibromyoma in the Clinic and found that the number of mitotic figures present was in direct proportion to the malignancy of the growth. In thirteen, mitosis was a very common finding, averaging from 2,200 to 12,000 for each cubic millimeter. Eleven of these patients were known to have had recurrence within eighteen months. In eleven cases mitotic figures ran from 200 to 800 for each cubic millimeter, and in the remaining forty-eight cases few or no mitotic figures were found. In both of the latter groups the end-results were excellent and as far as Evans was able to determine, there had been no recurrences. There is no doubt that mitotic figures are a common finding in the more malignant types of sarcoma, but whether Evans' findings will be constant remains to

be seen. In all probability they vary from time to time in the same tumor and in different parts of the same growth. Strong says, "The only safe criterion is infiltration and destructive growth. Mere richness in cells, mitosis and even irregularities in the size of cells does not constitute sarcoma."

From January 1, 1910, to January 1, 1921, 4322 patients were operated on at the Mayo Clinic for uterine fibroids and in only forty-four of these (1 per cent) were sarcoma cells found. In the same period, fibromyoma was diagnosed, but not explored in 3973 other cases. I am, therefore, inclined to believe that nonepithelial malignant tumors of the uterus are not common, and that 1 per cent of all tumors is a very high average. From the material at the Freiberg Clinic, Aschoff found that 1 per cent of fibromyomas showed sarcomatous change Many earlier writers reported a majority of their cases as originating in the uterine wall, but so far as I can judge from the material ex-

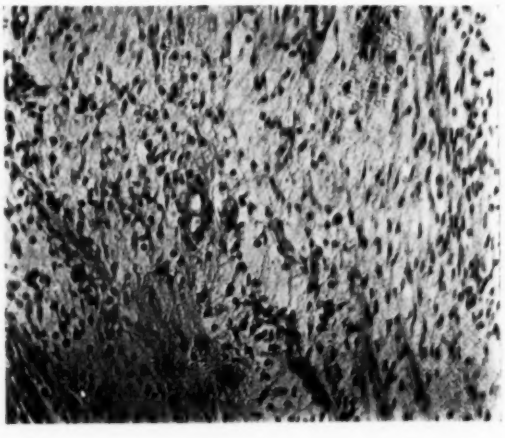

Fig. 6.—(A184003). Small round cell sarcoma at the endometrium. (X100).

amined, most cases that do not originate in preëxisting fibroids begin to develop in the stroma of the mucosa. There is no reason, however, why they should not develop from any part of the uterine wall, and in advanced cases it is impossible to know just where the malignant change commenced.

Melanosarcomas have been reported by Williams and others, but I prefer to include them with the epithelial tumors, and in a majority of cases they are probably secondary to growths elsewhere.

ETIOLOGY

The etiology of sarcoma, like that of cancer, is unknown and when discovered, will no doubt be important in controlling the disease. All we know of the two diseases is that the tumors are made up of cells more or less similar to normal cells of the body, that they

grow irrespective of the needs of the body, infiltrate and destroy neighboring tissues, metastasize to distant organs, and, if not thoroughly removed or destroyed, invariably lead to a fatal termination. There is no doubt that the two malignant diseases are in many ways similar, but they affect different tissues, metastasize differently, and, although age as an etiologic factor is no longer considered of great influence, it is nevertheless important. Chronic irritation is undoubtedly influential in carcinoma, but apparently is not influential in sarcoma. On exposed parts of the body sarcoma may follow extreme trauma, but this can hardly be a factor in sarcoma of the uterus.

SYMPTOMS AND DIAGNOSIS

The symptoms are not constant, and naturally depend to some extent on the position of the growth and a great deal on the nature of the growth. In many of the less malignant, slowly growing, encapsulated tumors it is impossible to differentiate the condition from a simple fibromyoma, while in other cases there is rapid growth, early cachexia, and a definite downward course in the well-being of the patient. Pain is more common than in cancer, and is often present between, as well as during the menstrual periods. A sarcoma occurring in the body of the uterus, or in a fibromyoma, gives symptoms during early development which are suggestive of a simple fibromyoma; later, when cachexia, hemorrhages, pain, and foul vaginal discharge are noticed, malignancy is suspected, but it is only after a microscopic examination by a competent pathologist that a distinction can be made between cancer or a necrotic benign tumor. One point of importance is the more rapid local growth of sarcoma; this is of special significance in a woman who develops postmenopause flowing with rapid enlargement of the uterus, or a tumor in the uterus, which was previously regarded as benign. Certain German writers consider the retrogressive changes due to radiation of differential diagnostic importance, since sarcomas, as a rule, respond much more rapidly than myomas to this form of treatment.

The size of the tumor and the length of time the malignant growth has been present, are not indications of the possibility of metastasis. Secondary involvement has been demonstrated in very few cases in which operation was performed, and most of the postoperative trouble comes from local recurrence. When metastasis occurs it is relatively much later than in carcinoma. Malignant tumors in the uteri of infants and young children are almost always sarcomas. No such cases occurred in this series. During menstrual life malignant tumors are more often cancerous, and after the menopause sarcomas are again relatively more common. The majority of cases occur in the fifth and sixth decades. In the fifty cases in the series the youngest

patient was nineteen years of age, the oldest was sixty-nine, and the average age was forty-four and eighty-six hundredths years, while in a series of 898 cases of cancer of the uterus treated in the Clinic during the last five years, the youngest patient was nineteen years, the oldest seventy-three, and the average age was fifty and five-tenths years.

Metastatic involvement of other organs is a relatively late development in most cases of sarcoma of the uterus. The one exception is small round-cell sarcoma of the stroma of the endometrium. When it does occur it is usually in the lungs; in the majority of cases the regional lymphatic glands are not involved until later. At necropsy small masses of malignant tissue are often found in the veins, and less often in the lymph spaces, showing that the involvement of distant organs is usually by way of the blood stream, but may also be by the lymphatics.

Weber, Dressler, and others have reported cases of general peritonitis following perforation of the uterine wall by necrotic sarcoma. Probably the most common complication is hemorrhage. In many cases this is in the form of a menorrhagia or metrorrhagia, but in some cases fatal hemorrhages have followed the sloughing of a sarcomatous polypus or the rupturing of a subserous tumor. Involvement of the ureters, bladder, and rectum, are late complications and are relatively less common than in cases of carcinoma.

Spiegelberg and Simpson both reported cases of inversion of the uterus as the result of traction exerted on the fundus by sarcomatous masses and softening of the lower uterine segment following malignant invasion.

TREATMENT

The treatment of sarcoma of the uterus is now in a transitional stage. Until recently surgery was considered the only rational treatment and in the majority of cases the results were very satisfactory; in fact, much better than in operations for carcinoma. The most unsatisfactory cases were those in which the growth originated in the endometrium, or in the cervix. It has long been known that sarcomas respond in various ways to roentgen-ray treatment. Werner and Wetterer, roentgenologists of great experience, say that it is characteristic to obtain the most surprising results in some cases and complete failures in others. The fact that even with modern technic from 20 to 24 per cent of all cases of sarcoma remain unchanged shows that definite results cannot be expected from radium therapy.

The pendulum is swinging toward the treatment of these tumors by radium and deep roentgen-ray treatments by means of which many apparent cures have been obtained. I have already referred to Grad's

convincing early papers on the subject. In 1916 Professor Baisch reported three cases treated. One patient had a very large, foul growth filling the vagina, and severe constitutional disturbances. One treatment of radium was followed by marked improvement. The patient was apparently entirely well three months later.

On the other hand, in 1918, Wagner reported a case in which he believed sarcoma developed as the result of roentgen-ray treatments for a fibromyoma. From his notes, however, it is difficult to rule out the possibility of the earlier development of sarcoma and that the roentgen-ray treatments simply caused necrosis of the growth and symptoms of acute pelvic conditions.

Von K. Franz, Kehrer, von Schauta, and Hinterstoisser have also reported cases in which the sarcoma became necrotic following radiation. Although there are no such cases in my series, I have seen the same trouble following the treatment of carcinoma, and also simple fibromyoma of the uterus. Certain writers advise immediate operation and removal of the uterus and adnexa as well as the necrotic tumor. As in all acute abdominal conditions, if an operation is to be performed, it should be performed as soon as possible after a diagnosis has been made. If not, it is advisable to treat the case expectantly by the Ochsner-Murphy treatment for peritonitis, and to open any abscesses that may develop later.

At a meeting of the German Gynecological Congress in 1920 the concensus of opinion was that no patient with sarcoma of the uterus should be operated on since the results following radiation were so satisfactory. Seitz and Wintz report eighteen patients treated by roentgen ray with four deaths (22.2 per cent). The other patients are all apparently cured, some of them for more than four years. Roentgenologists, and those with an ample amount of radium at their command are very enthusiastic over the results obtained by radiation. There is no doubt concerning the beneficial effect of these agents, but whether permanent cures are obtained in a high percentage of cases remains to be seen. I believe that, in these cases as in all malignant epithelial growths of the uterus, surgery should be resorted to early, and followed by deep roentgen-ray therapy.

For the patients with the more advanced growths and particularly for those who would be considered poor surgical risks, I advise radium in full doses to be followed by repeated courses of roentgen-ray radiation. In all inoperable cases and cases of sarcoma with metastasis, as well as recurrences following operation, roentgen-ray treatment should be given.

Many published statistics seem to show that radium therapy is very satisfactory in many cases of fibromyomas with, or without malignant change. Sarcomas as a group are more susceptible to radio-

active substances than carcinomas, and from the amount of literature on this subject, there is no doubt that we will soon have valuable data on which to base conclusions. It is unfortunate, however, that trustworthy pathologic examinations are not made in many cases believed to be sarcoma and treated as such. It cannot be said that radium is free from danger. I have had one patient die from pulmonary embolism following its use. In one case of carcinoma and in several cases of fibromyoma I have seen its use result in marked pelvic infection with abscess formation.

I have had no personal experience with the use of Coley's fluid in sarcoma of the uterus, nor have I seen it mentioned in the literature, but if given by one accustomed to using it, I should expect beneficial results, particularly when combined with radium treatment.

If surgery is decided on, a modified Wertheim hysterectomy should be performed. If the cervix is involved it should be thoroughly destroyed by cauterization immediately before the abdominal operation to prevent possible grafting of malignant cells. If the patient's hemoglobin is below 40 per cent one or more transfusions of at least 500 c.c. of blood should be given twenty-four or forty-eight hours before the operation. If, following a myomectomy, the pathologist reports the tumor to be a sarcoma or a fibromyoma with sarcomatous change, I agree with Taylor that the safest plan is to perform a panhysterectomy immediately, although simple myomectomy will, no doubt, cure many of the patients if the growth is still encapsulated.

MORTALITY

If all cases are considered, the mortality following radical pelvic operations for malignancy is rather high, but such operations should be performed only in well-organized hospitals, in suitable cases, by surgeons skilled in pelvic operations. Under such conditions the mortality should not be more than from 2 to 4 per cent.

In the series of fifty cases there were two deaths, an operative mortality of 4 per cent. Answers to questionnaires were received regarding forty-seven of the remaining forty-eight patients. Ten had died, four within one year of the date of operation, and the remaining six within two years. In all probability most of them died from recurrence of the malignant growth. Thirty-six (76.59 per cent) are apparently in good health or at least have no symptoms to suggest recurrence. One patient reported that she is feeling much worse, thinks there is a recurrence of the growth, has marked dyspnea, weakness, and dropsy. In all probability she is suffering from a recurrence, but the possibility of a cardiorenal disorder must also be considered, as it is now five years since her operation.

TABLE I

THE OCCURRENCE OF NONEPITHELIAL MALIGNANT UTERINE TUMORS AS COMPARED WITH FIBROMYOMAS (FROM EVANS)

	FIBROMYOMAS	SARCOMA	PERCENTAGE
Proper and Simpson	357	22	6.00
Miller	9750		1.96
Lewis	1518		1.40
Olshausen	6470		1.30
Kelly and Noble	2274		2.00
Winter	500		3.20
Winter	253		4.30
Noble	337	2	0.60
Kelly and Cullen	1400	17	1.20
Martin	205	4	1.90
Fehling	409	8	1.90
Broun, Woman's Hospital, N. Y.	1500	7	0.40
Warner	100		
Including all "cellular sarcomas" only		7	7.00
		2	2.00
Geist	250	12	4.80

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OBSERVATIONS WITH COMMENTS ON A STUDY OF THE URINARY TRACT OF EIGHTY FETUSES AND YOUNG INFANTS*

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OWING to the scarcity of records on the pathology of the upper urinary tract in early life, the following observations were made during the summer of 1922. While this report is to be considered as merely preliminary, owing to limited time and material, a number of important points will be worth noting, which with others are capable of elaboration by further study. As an aid to the work suggestions are solicited.

The material at hand may be divided into three groups. The first is made up of twenty fetuses obtained during the summer, all being recent abortions. They range from two and a half months to term. The second group includes twenty cases of young infants and prematures on which autopsy records are available, and in addition, a few scattered cases in which only the specimens were obtainable. The third is a group of forty dissections made in the Department of Pathology at the Detroit College of Medicine and Surgery. The majority of these latter cases presented some type of monstrosity or maldevelopment.

The point to be noted in connection with the nature of the material under observation is that in no case was it selective, except in those few instances in which only the actual specimen was available. A random selection was made, the percentage of kidney pathology, whether primary or secondary, being for this reason the more significant.

THE KIDNEY IN THE FETUS AS A SEAT OF CHRONIC INFLAMMATORY CHANGES

Out of the forty microscopic examinations made, seven cases showed well defined characteristics of chronic inflammation. In two of these cases, the change was of known syphilitic etiology, and in four others the evidence was also that of syphilis, though the laboratory findings were negative. It is of interest to note the early age at which these evidences of chronicity become apparent. A case of induced abortion of a two and a half month's pregnancy gave a picture of definite fibrosis of the nephrogenic tissue with proliferative increase of the

*Read at the Thirty-fifth Annual Meeting of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, Albany, N. Y., September 19-21, 1922.

embryonal connective tissue. Another fetal kidney, of four months' development, was diffusely infiltrated with small round cells, with increased connective tissue elements—a picture of proliferative interstitial nephritis. Another, a five months' kidney, presented, in addition to the above pathology, proliferative blood vessel changes—the characteristic endarteritis of adult syphilitic lesions. It has been observed that this blood vessel involvement is not a constant accompaniment of luetic changes in early life. It may be entirely absent, while the existent changes are strikingly specific. A case of an infant, ten days old at death, clearly corroborates this observation. The kidney showed diffuse interstitial fibrosis in both medulla and cortex, with hyaline degeneration of the tubular epithelium, and no vascular change whatever.

Observations of syphilitic changes in fetal kidneys are noted by J. W. Ballantyne in his "Antenatal Pathology and Hygiene." He has found in addition to the facts noted, enlargement of the vessels of the medulla, but he does not record the possibility of the total absence of vascular pathology. Ballantyne has also reported two cases in which there was strong evidence of chronic idiopathic fetal nephritis. One baby died a few hours after birth, the other at twenty-one days. There exists, then, the possibility that the pathology of the fetal kidneys reported above was idiopathic, at least in those cases where syphilis was not the cause. No proof exists, however, that such is the case.

HEMORRHAGIC CONDITIONS INVOLVING THE YOUNG KIDNEY

Although hemorrhagic diseases are known to be of frequent occurrence in the newborn, no reference has been found to diffuse hemorrhages in young fetuses. Of the six cases observed, three were fetuses, two and a half months, three and a half months and six months old. The first of these was a pregnancy aborted by drugs. The fetus showed multiple subcutaneous hemorrhages all over the body. The abdominal cavity was filled with a sanguineous fluid, and the viscera showed multiple small hemorrhages. Microscopic examination revealed marked subcapsular hemorrhages of the kidney, though the parenchyma was uninvolved. The three and a half months' fetus did not show any external evidence of hemorrhage. The kidneys, however, looked hemorrhagic when opened, and the microscopic picture was one of small cortical hemorrhages.

The cause for hemorrhage in the kidney of the six months' fetus was probably mechanical, occurring in a case of imperforate urethra with hypertrophic dilatation of the bladder and extreme general edema. Reference will again be made to this case.

A case of primary hemorrhagic nephritis was noted in a young

infant and was considered the primary factor in causing death. There was no gross pathology other than malnutrition.

A very spectacular case of hemorrhagic diathesis and thymic apoplexy was seen in a baby of three days. (Fig. 1.) A large dark red mass was found in the abdomen, extending from the diaphragm to below the umbilicus, to which the intestines were adherent, and by which they were displaced. The mass was found to be a retroperitoneal blood clot, and when sectioned, revealed the kidney imbedded in the center. The thymus was greatly enlarged and ruptured by the excessive

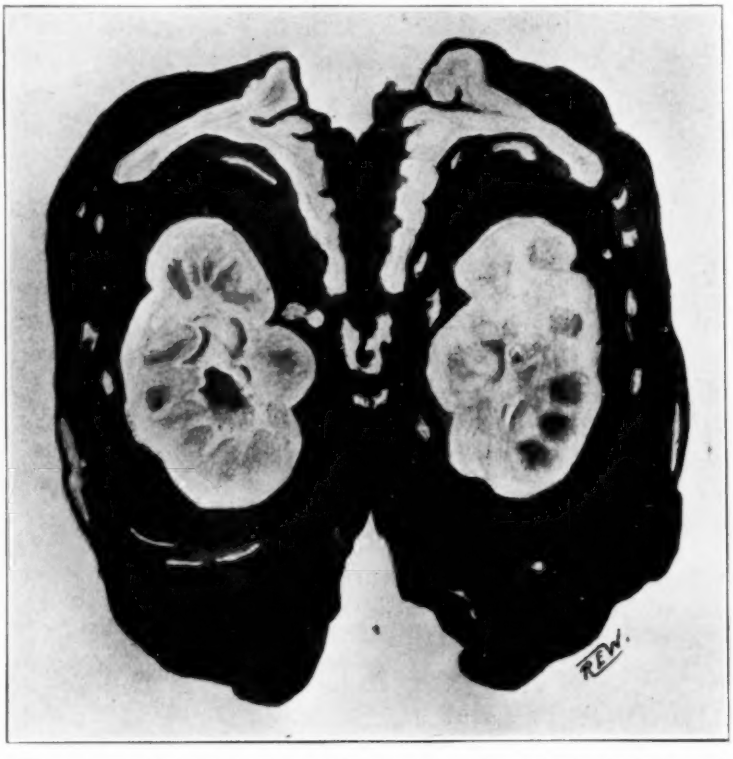

Fig. 1.—Kidney embedded in blood clot from case of hemorrhagic diathesis and thymic apoplexy.

hemorrhage. Microscopic examination of the kidney showed no minute pathology.

SECONDARY CHANGES IN THE KIDNEY IN INFECTIOUS DISEASES

In every case of death caused by an infectious process, the effect on the renal parenchyma was marked. The changes noted represent (1) actual metastasis of infection involving the cortex of the kidney, (2) interstitial changes of a chemical nature and (3) degenerative processes. The type of kidney pathology depends, evidently on the type of infection and the duration of the condition. A case of compara-

tively long-standing infection terminating in suppurative otitis media and lobar pneumonia presented evidence of metastasis of the infection to the kidney, as shown by the definite cortical foci of infection. The tubular elements were distended with fluids and in a condition of early degeneration. Two kidneys, one from a case of chronic pneumonitis and acute terminal purulent bronchopneumonia, one from a case of prematurity and malnutrition with an unknown focus of infection, presented a similar type of change, namely hyaline degeneration of the renal epithelium. The cortex in each case was a mass of degenerating elements, matted together in a way to minimize the possibility of functionating. There was intense congestion of the blood vessels and of the capillaries of the medulla in the kidney of the premature.

A picture of interstitial nephritis with obliterative parenchymatous degeneration was seen in the kidney of a four months' baby which died of acute encephalitis. All the functionating elements were shrunken and evidently nonfunctionating while the interstitial elements showed proliferation and edema.

A secondary inflammatory condition, not of an infectious nature may be mentioned in this connection. At autopsy of a six day infant, an imperforation of the common bile duct at the junction of the cystic and hepatic ducts was discovered, death having been caused by toxic bile retention. Inflammatory changes of purely chemical nature occurred in the kidney. There was albuminous degeneration of the tubules, sclerosis of some of the glomeruli and intense capillary congestion in the medulla, with retention of bile pigment in the straight tubules.

MALIGNANT TUMOR OF THE KIDNEY IN AN INFANT

Malignant tumors of sarcomatous nature are seen in early life. L. Porter and W. E. Carter report the existence of such tumors in kidneys of six months' fetuses, and refer to a case in which labor was obstructed by the presence of a large round-cell sarcoma having its origin in the renal tissue. (Figs. 2 and 3.)

In the present group, one case of renal malignancy occurred in an infant of seven months. An exploratory operation was made, but the growth had become too extensive to permit of any surgical treatment. The history of the tumor was that of rapid growth with very marked enlargement during the last days before the operation. Some of the tissue was removed following which severe hemorrhage and death occurred in a few hours. The kidney capsule was distended by the growth which appeared almost entirely intrarenal, excepting that the capsule and adjoining mesenteric lymph glands appeared involved in the tumor. The tumor was solid, opaque and

apparently divided into lobules. Considerable hemorrhage was evident within the tumor, and there was some hemorrhage without. The liver was pale and yellow suggesting depletion from hemorrhage.

RENAL CALCULI WITH CEREBRAL CALCIFICATION IN A CHILD ONE YEAR AND SEVEN MONTHS OLD

The patient was rachitic, having had a number of illnesses after the eighth month of life. First he had diphtheria for three weeks

Fig. 2.—Lymphoblastoma of kidney in 7 months infant.

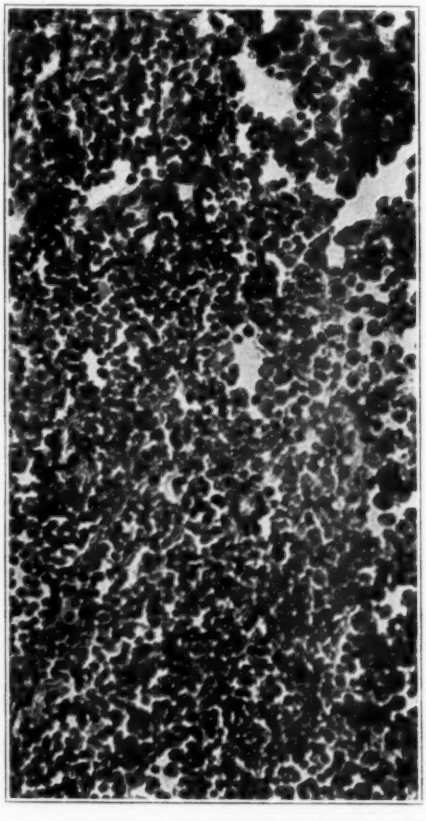

Fig. 3.—Higher magnification of neoplasm shown in Fig. 2.

from which he made an uneventful recovery. When a year and one month old he started to have a temperature varying between 100° and 106.2°. This lasted for fourteen weeks. At the same time the right arm became paralyzed. Diagnosis was not made at the time, though it was positively stated that it was not infantile paralysis. Five months later the patient had a mild attack of chicken-pox, and recovered without complications. A week before death he again developed the characteristic temperature varying between 100° and

106°, was prostrated and continually rolled his head from side to side.

At autopsy, the lungs were found to be consolidated, the brain congested. The right kidney exhibited a dilated pelvis with two

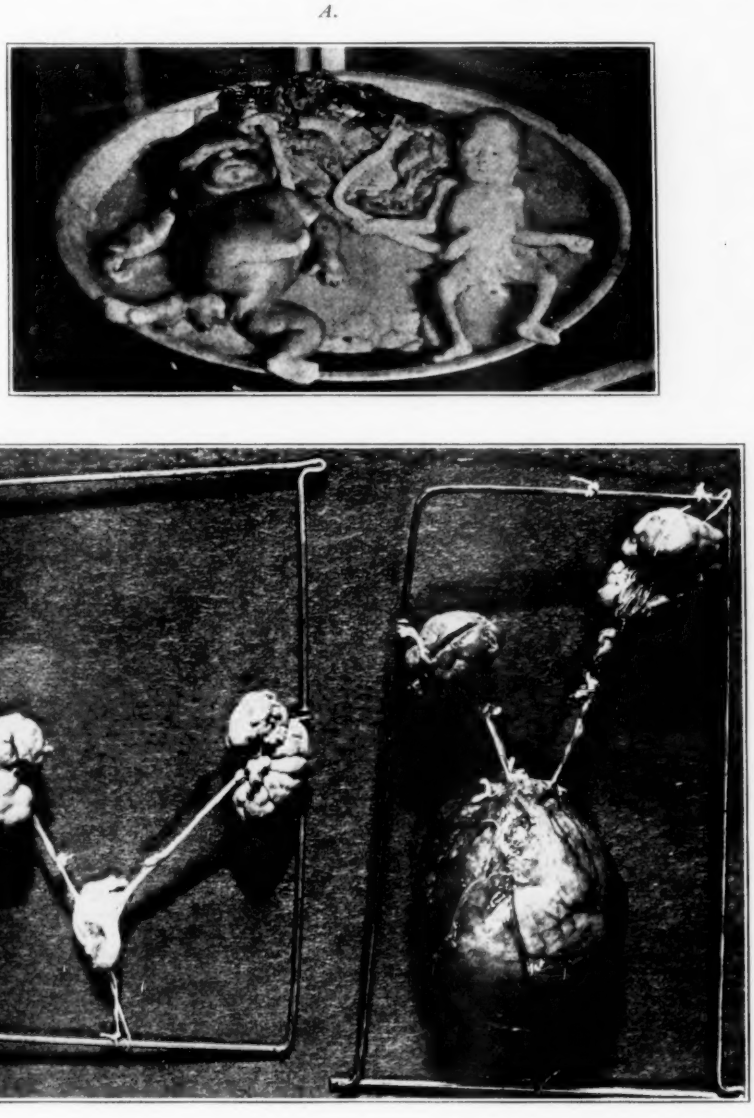

Fig. 4.—*A*. Premature twins delivered at 6 months by cesarean section.
B. Normal kidneys, ureters and bladder from normal fetus.
C. Greatly distended bladder, hydroureters and slight hydronephrosis from edematous fetus.

small concretions 3 mm. in diameter one in each of two calyces. Microscopically the kidney showed no pathology other than congestion, but the brain showed rather extensive areas of calcification, these

being surrounded by small round cells of the lymphocytic type. The spleen showed early amyloid degeneration.

Varying opinions exist concerning the frequency of urinary stone formation in infancy. F. Hinman quotes two figures in his report of a case of multiple ureteral stones in an infant. Rafin, in an analysis of thirty-nine cases of renal and ureteral stones recognized at operation and autopsy, finds none of the patients under one year of age, and only five between the ages of one and five years. But Rayer writes that renal calculi have been observed at all ages, including the fetus and infant. He cites ten cases, two fetuses of six and eight months, three newborn infants of one, two and eight days and five of three, four, six and eight months.

EXTREME GENERAL EDEMA ASSOCIATED WITH IMPERFORATION OF THE URETHRA

This occurred in one of premature twins, delivered at six months by cesarean section. The mother's blood showed a positive Was-

Fig. 5.—Horseshoe kidney.

sermann reaction. She had one child a year and a half old which was living and apparently healthy. Two days before the operation her abdomen began to ascend very rapidly, until the enlargement reached the sternum. On opening the uterus extreme hydramnios was encountered. The two fetuses were removed within a few minutes of one another. (Fig. 4.) Their appearance was strikingly contrasted. One, breathing at delivery, was small, wrinkled and poorly developed. The other, dead at delivery, was enormously enlarged by a severe, general edematous condition. Arms and legs were like bags of water, and the abdomen was greatly distended. On opening the abdominal cavity, free peritoneal fluid was encountered and the bladder was found to extend to above the umbilicus. It was greatly dilated, containing two and a half ounces of fluid; and its blood vessels were congested. The ureter was enlarged, and sacculated especially near

the kidney. The kidneys showed mild hydronephrosis, and were swollen and boggy. After dissecting out the bladder it was found that none of the fluid could be forced out through the urethra—an imperforation was discovered very near the bladder. Chemical analysis of the fluid contained within the bladder revealed the presence of urea in addition to large amounts of protein. It partook beyond a doubt of the nature of urine, and may throw some light on the much discussed question regarding the functioning of kidneys in prenatal life. The general edema may, at least partially, if not entirely, be laid to the mechanical obstruction caused by the imperforate urethra, though the enormous degree to which it had risen may

Fig. 6.—Fused kidney with double hydroureter.

have been due to some condition not accounted for. The microscopic examination showed only extreme dilatation of the blood vessels with some hemorrhage, with no characteristic luetic change. Examination of the placenta showed only mild edema.

MALFORMATIONS

Of the eighty fetuses and infants studied thirty-seven presented some form of outward malformation. Nineteen showed craniorachischisis; three, hydrocephalus; four, exencephalon; two, meningocele; two, deformities caused by amniotic adhesions; two, congenital hernia, and one each of the following: synophthalmus and arhinencephalon,

cephalothoracopagus, talipes, meningo-encephalocele occipitalis and one pair of united twins.

Malformations of the upper urinary tract existed to the extent of twenty per cent of the total number studied involving the kidney, and 11.25 per cent involving the ureters. Six cases showed hydronephrosis, four bilateral and two unilateral. Two with congenital cystic kidneys were found, one bilateral, one unilateral. Two cases showed deficiency or absence of lobulation, two pressure deformities, and two malposition, and in two, fusion, one of which was associated with hydroureters. (Figs. 5 and 6.) Of the ureteral malformations, there

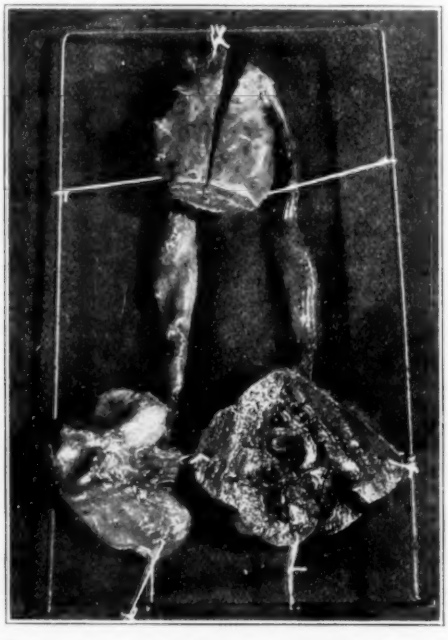

Fig. 7.—Hydroureters with bilateral congenital polycystic kidney.

were five cases of hydroureter (Fig. 7), two bilateral, three unilateral; two cases of double ureters, one unilateral and one bilateral (Fig. 8); two kinked ureters, and one of bilateral tortuous ureter. The latter was the result of malposition of both kidneys and bladder, the ureters, spirally twisted in their entire length, being enclosed in a connective tissue sheath not involved in the torsion.

The occurrence of definite kidney and ureteral deformity accompanied each of the three cases of hydrocephalus studied. One showed bilateral hydronephrosis and one unilateral hydroureter and hydronephrosis (Fig. 9). The third showed a left ureter 9 cm. long, dilated in its entire length to more than a centimeter in diameter, while on the other side the ureter was 2 cm. long, the kidney being immediately

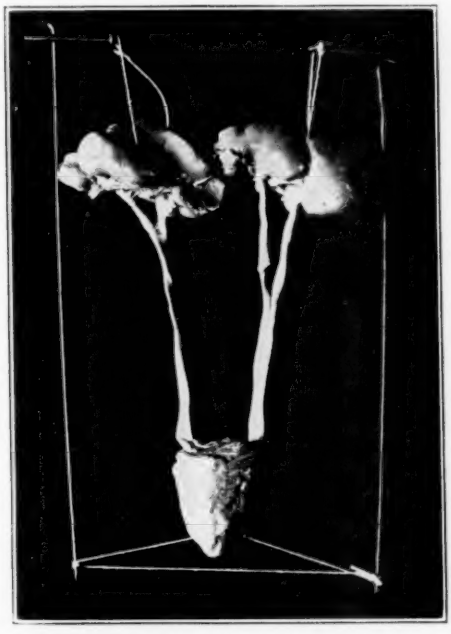

Fig. 8.—Bilateral double ureter.

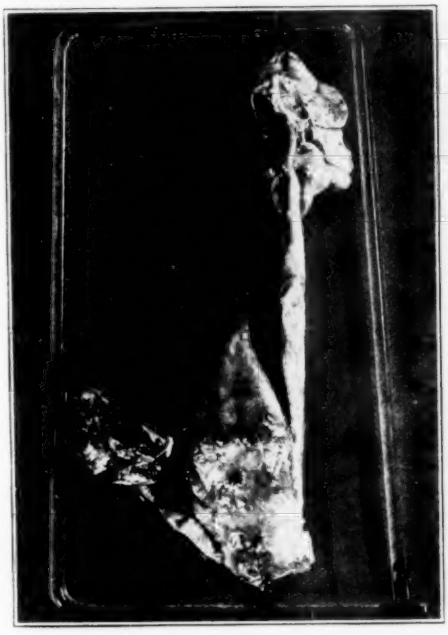

Fig. 9.—Congenital non ascent of right kidney with short ureter and dilatation of left ureter.

adjacent and posterior to the urinary bladder, which was enlarged and had thick walls.

There is apparently some close relation between kidney and brain

development. Does the hyperfluidity in the urinary tract in cases of hydrocephalus, warrant raising the question of the possibility of some intimate connection between the kidney, and the choroid plexus of the brain? The frequency of kidney malformation in cases of craniorachischisis and exencephalon is also of note. Arrested development or absence of the suprarenal is also frequently a part of this type of maldevelopment. Some researchers have observed that almost every case of craniorachischisis shows absence of adrenal bodies. In the present group of cases, one adrenal associated with craniorachischisis was found, showing delayed development of the cortical zone. We are quite aware that the adrenal bodies are not an integral part of the urinary tract, but feel justified in including them in this report, since "in their embryological development their cortex is derived, at least in part, from epithelial outgrowths which proceed from the mesonephros." (Heisler.)

PERCENTAGE OF PATHOLOGIC LESIONS ENCOUNTERED

It is a striking fact that upon résumé of the entire material studied, only twenty-five cases, or 31.25 per cent were found entirely free from pathology. It is true, a group comprising 13.75 per cent of the cases showed only such slight changes as edema and passive congestion, but these also aid in confirming the evidence that the kidney is a vulnerable and exceedingly responsive organ from its earliest stages of development. In this series 68.75 per cent were abnormal, and of this number only nine cases presented negligible alterations. Let it again be recalled that the material was not selected, but all that was available during this short study period was used.

CONCLUSIONS

1. Evidence of chronicity becomes apparent at an early age, even in the early months of fetal life.

2. Blood vessel involvement is not a constant accompaniment of luetic changes in early life.

3. Kidney hemorrhages, both primary and secondary, are not rare in fetuses and young infants.

4. Fetal kidney inflammatory changes may be either acute or chronic, primary or secondary, infectious or noninfectious (chemical).

5. Malignant kidney tumors of sarcomatous nature are seen during the very early months of life.

6. Renal calculus occurs in early life. (Prenatal and early postnatal.)

7. The kidney in our opinion manufactures urine months before maturity of fetus, and probably in considerable quantity. Also the

fetus may develop a toxemia from retention, in its blood stream, of kidney products independent of the blood stream or kidney efficiency of the mother.

8. There apparently is a close relationship between the kidney and the brain in their development. Also between the brain and the adrenals.

Finally: Is there a faulty metabolism that fathers maldevelopments of the urinary tract or what is there that lends itself developmentally to malcoordination?

13300 Woodward Avenue. (*For discussion, see p.* 430.)

GLYCOSURIA TEST FOR PREGNANCY*

By Philip F. Williams, M.D., Philadelphia, Pa.

(*From the Gynecological Service of the Presbyterian Hospital in Philadelphia.*)

In order to estimate the value and the relative merits of the various methods proposed during the past year of utilizing renal or experimental glycosuria as an aid in the diagnosis of early pregnancy, a series of pregnant, recently pregnant (aborting), and nonpregnant women have been tested with each of the three suggested methods. The use of an alimentary, renal or experimentally produced glycosuria in the diagnosis of early pregnancy is based upon the premise that the sugar tolerance in pregnant women is greatly below normal. Glucose as a normal constituent of the blood stream is found in a concentration of from 0.09 to 0.11 per cent. This varies somewhat with the diet and is also found to be increased physiologically in certain emotional disturbances, that is, a relative hyperglycemia occurs. During pregnancy and menstruation a slight rise in blood sugar is also present. A varying hyperglycemia exists in quite a number of pathologic conditions, as diabetes, hyperthyroidism, disturbances of liver function, and carcinoma.

The study of carbohydrate metabolism in various normal and diseased conditions has shown that different reactions follow the ingestion of large amounts of glucose in different conditions, and for these conditions the behavior of the blood sugar has been so constant that distinct types of reactions are recorded. The majority of pregnant women have been found in the so-called "Type two," in which after the ingestion of a certain amount of glucose the blood sugar percentage rises during the first forty-five minutes, and sustains this level during and after another forty-five minute interval. According to Bailey, a normal person, when uninfluenced by fluid or

*Read before the Obstetrical Society of Philadelphia, October 12, 1922.

fluid intake, has reducing substances for copper tests present in equal concentration in both blood and urine. Following the ingestion of glucose the urinary sugar curve runs parallel to that of the blood sugar up to the latter's concentration, 0.16 or 0.17 per cent. As the blood sugar increases beyond this point the kidneys actively engage in its elimination; as the hyperglycemia disappears the excess in excretion in the urine likewise disappears. This function on the part of the kidneys to eliminate glucose when this accumulates beyond a certain point is increased in certain diseases and diminished in others. In the past it has been customary to regard that form of glycosuria which follows the ingestion of 100 gm. of glucose, and which is demonstrable with the ordinary copper tests as digestive glycosuria, and the ability of the kidneys to prevent the leakage of sugar into the urine, as the sugar tolerance. If glycosuria follows the ingestion of 100 gm. of sugar, as glucose, one speaks of that person as having a low sugar tolerance, whereas if no glycosuria follows the ingestion of 200 gm. the sugar tolerance is considered as being high.

Several years ago Frank and Nothman observed that pregnant women had, during the early months of pregnancy, a lowered sugar tolerance without an abnormally high glycemia. From their studies they concluded that this point was of value in the diagnosis and differential diagnosis of pregnancy.

They carried out the test as follows: A fasting pregnant woman was given 100 grams of glucose in 500 c.c., of tea. The bladder was emptied immediately and specimens of urine obtained thereafter at intervals of fifteen minutes for a period of 120 minutes. The blood sugar was estimated at the time of ingestion of the glucose and at the height of the test, usually forty-five minutes to an hour later. Positive responses were obtained in all cases after about forty-five minutes, a positive response being a glycosuria ranging from 0.2 to 0.5 per cent, with the blood sugar remaining under or not above 0.17 per cent. The response was constantly negative in the cases in which pregnancy was disproved later.

More recently other observers utilized this test, and naturally certain modifications appeared advisable. The ingestion of such a large amount of sweetened fluid was followed by nausea and vomiting which interfered with the test, and to avoid this Roubitschek employed a combination of the original method, reducing the amount of glucose to 10 gm., and adding an injection of 0.5 c.c. of epinephrin solution, 1 to 1,000. This latter substance has been found to rarely produce glycosuria in normal persons in this dosage, but does so rather frequently in pregnant women. With his modification this observer found positive responses in 19 of 20 pregnant women tested.

To entirely obviate the uncertainties of the alimentary absorption of glucose, Kamnitzer and Joseph have used injections of phloridzin. Phloridzin is a drug which depresses or lowers the renal threshold

or permeability to the normal sugar content of the blood, thus permitting a leakage of sugar into the urine. In a normal healthy person 0.01 gm. will induce a glycosuria. A pregnant woman reacts to one-twentieth of this dose, 0.002 gm. In three hundred cases these observers had conflicting findings in only six cases, a remarkably high percentage. Their series included 213 control cases, 67 pregnant women, 17 aborting women and three tubal pregnancies.

In order to test these proposed methods the pregnant and aborting women in the gynecologic service of Dr. John H. Girvin, at the Presbyterian Hospital, were subjected to the tests, and I wish here to express my obligation to Dr. Girvin for his courtesies. A first series of ten women were tested by the original method proposed by Frank and Nothman. This series included six aborting women and four women pregnant earlier than four months. The blood sugar did not reach 0.16 in any case. All showed a glycosuria after from thirty to forty-five minutes. The percentage of sugar in the urine was in a few cases higher than the values given by Frank and Nothman.

A second series was then tested by the modification proposed by Roubitschek. These eight women, six aborting and two in early pregnancy, were given glucose and epinephrin. In but one case was a positive response obtained. In not one of these cases did the blood sugar rise above 0.15 per cent at the end of forty-five minutes after the administration of the test materials.

After some difficulty a quantity of phloridzin was obtained and a solution made up in exactly the manner described by Kamnitzer and Joseph: Phloridzin, 0.03 gm., procaine, 0.015 gm., distilled water, 30.5 c.c. The whole solution is boiled to ensure sterility and to dissolve the phloridzin. Two c.c. of this solution represents 0.002 gm. of phloridzin. This dose is injected into the gluteal muscles of a fasting woman. The bladder is emptied and the woman drinks 200 c.c. of water. Specimens of urine are obtained at intervals of fifteen minutes. It was found practicable to insert a catheter and clamp it, thus there is no difficulty about draining the bladder. Six specimens are withdrawn and the catheter removed.

Fourteen cases were tested by this method, eight pregnant women, four abortions, and two tubal pregnancies. In but two cases, both pregnant, was a positive response obtained. The blood sugar showed no rise during the test.

These discordant findings have been rather puzzling. A series of controls were then carried out on nonpregnant women, and in but one was a positive response obtained. This occurred in a fifty-three-year-old woman following an operation for prolapse, who showed a slight glycosuria following the administration of 100 gm. of glucose. In no other case with any of the methods was a glycosuria obtained.

Why this lowered sugar tolerance should occur in pregnant women has not been determined. There have been recorded slightly positive reactions in women at or about the time of menstruation and it is possible that some unknown influence of the corpus luteum on the carbohydrate metabolism may play a part. This seems plausible in view of the fact that the test has been found to be of no value in the later months of pregnancy, that is, that no lowering of the sugar tolerance is present. In looking carefully over the few published papers relating to this work it was noted that the reaction was said to disappear in from one to ten days after an abortion, but continued positive in the cases of abortion or tubal pregnancy where a large amount of functionating placenta remained attached, and presumably actively proliferating. This might suggest that the chorionic villi or the syncytium played a part in the mechanism whereby the reaction is produced.

Possibly at best it may only prove to be another probable sign in the diagnosis of early pregnancy, but the ease with which any of the methods may be carried out, and the entirely uniform positive results obtained by the first method would lead me to apply it as a further aid in establishing a diagnosis in a questionable case.

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CRANIOTOMY*

By A. M. Mendenhall, M.D., Indianapolis, Ind.

THE subject of craniotomy is one infrequently chosen by an essayist, yet its importance as an obstetric operation seems to thoroughly justify its consideration and discussion from time to time.

There are two or three reasons why this subject is not more often brought before medical societies, among them being the fact that the operation carries with it a certain gruesomeness which is not without its effect upon the operator and his assistants and audience; no obstetrician cares to perform this operation especially and has no desire to be known as an expert in this line. Then there are certain well-known religious views which are in opposition to craniotomy under a great many conditions.

Nevertheless it is not well that any of these reasons should be al-

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lowed to place this important obstetric procedure so far in the background that it is in danger of being overlooked.

I am sure there is no one of any considerable experience in obstetrics who has not frequently known of cases where good opportunity and indications were present for craniotomy, but where the operation was seemingly entirely overlooked. Then again we are all aware of many cases where craniotomy has been done quite needlessly.

With my chief purpose in offering this subject for consideration being to emphasize first that craniotomy should be done in many cases where it is not done, and secondly should not be done in many cases where it is being done, I shall first of all discuss the indications.

In all cases where the fetus is dead and delivery is not progressing quite rapidly and easily, there is no doubt whatsoever about the propriety of craniotomy, except in that rare instance where we have to deal with a large child and a true conjugate of 5 or 6 cm. or less.

There is no excuse for the application of forceps to the head of a dead child. Neither do we feel that a version on a dead child is ever indicated. In case the child is dead and for any reason it seems desirable to aid in the delivery, it is far better for the mother, and in this instance she is our only patient, that we should first of all perforate and reduce the size of the head.

In this connection I desire to quote from DeLee[1] in his discussion of the impropriety of forceps or internal podalic version delivery of a dead child.

> "The result of continued attempts (with forceps) is severe tears, hemorrhage, and puerperal sepsis. The mother may be left a life long invalid. The second operation that is too often undertaken to get around the necessity of hurting the dead child is version. . . . . The operation of craniotomy is simple, requires less skill than version, has no attendant dangers, other than those the operator can avoid, sepsis and injury to the soft parts. . . . . To do a version, or a forceps, or a cesarean section is not justifiable when the child is dead." Still quoting DeLee[2] "No accoucheur should have any compunctions about mutilating a dead child, yet I have seen the most serious operation carried out by physicians in order to avoid the necessity of perforating a piece of lifeless clay. Either they fear opprobrium, or they overrate the dangers of craniotomy. Craniotomy is chosen, the fetus being dead, whenever an indication arises for immediate termination of labor. Craniotomy is less dangerous than forceps. Sentimental reasons advanced by the family should not stand in the way of the accoucheur doing the best for the mother. When the child is dead, even if there is no indication for the immediate termination of labor, perforation of the cranium and reduction of its size may be desirable. This is true of primiparae—we wish to save the levator ani and pelvic outlet from overstretching, and, further, it is thus possible to shorten the time of labor."

The writer believes that one of the real reasons why an operator may refrain from performing craniotomy is the fear of the family's criticism and the fear that he may be blamed for the death of the child. There can be but one answer to this attitude, tell the proper

members of the family that the child is dead and by a destructive operation upon it, the mother's life and health can be better safeguarded.

Very often during the course of a hard forceps delivery or an internal podalic version or breech extraction, it is wise to refrain from further attempts at delivery long enough to ascertain the condition of the child, and if it is discovered that the cord has ceased to pulsate, resort should be promptly made to the perforator. The obstetrician is frequently called to aid in the delivery of the after-coming head and naturally arrives some time after the death of the child and in cases of this kind the perforator is always the instrument of choice.

Not long since there was reported in the medical literature a case where a physician in attempting to extract an after-coming head succeeded only in extracting the body and leaving the head in the uterus. For the removal of this head a cesarean section was done and in describing the huge size of the head which was hydrocephalic, it was stated that an extra large incision in the uterus was necessary in order to remove the head. It would seem that in this case there were none of the indications for hysterotomy and most all the contraindications. Before the body was pulled away from the head or even afterwards it should have been quite easy to perforate and crush this head and remove it with far less jeopardy to the mother.

Above all else it seems that we need to more firmly establish in the minds of physicians that a dead baby or in this extreme case only its head, is nothing more than a foreign body and should be handled merely as such; that when the baby dies we have one and only one patient and all our efforts should be concentrated toward the conservation of the life and health of that one patient.

As to craniotomy upon a living child, many questions of doubt arise. It is not difficult to find many excellent authorities who find many indications for craniotomy when the child is still living.

First of all, and probably most frequently of all these borderline cases, is that of the hydrocephalic child. In the minds of most obstetricians there is little hesitancy in recommending a perforation where the diagnosis of hydrocephalus can be made with at least a high degree of certainty.

In our present position of being unable to give more than a very serious prognosis as to life or mental and physical development of the hydrocephalic and with a thorough appreciation of the great weight upon relatives and society by the presence of the ordinary case of hydrocephalus, it would seem that craniotomy is a legitimate and merciful operation in every case where consultation of medical men points to a definite diagnosis of hydrocephalus and at least

where the size of the head seriously jeopardizes the mother. Certainly no mother's life should be hazarded to the extent of a cesarean section with reasonable assurance that the child to be obtained is afflicted with hydrocephalus. Then along with hydrocephalus should be mentioned a great many of the monsters with which we may come in contact, though it is more seldom that we are able to make the antepartum or intrapartum diagnosis. If the diagnosis can be made prior to delivery and especially if confirmed by the x-ray, no attempt at cesarean section, internal podalic version, or forceps on such a case that is offering any serious degree of dystocia should be made.

No hesitancy should be felt in perforating the head of a child prior to viability in all cases where rapid delivery seems imperative. In this class should be mentioned eclampsia, placenta previa, premature separation of the placenta, toxemia, nephritis, or other constitutional disease of the mother. Often in cases of spontaneous miscarriage a rigid cervix very greatly delays the labor when perforation alone would promptly end a hard and painful and sometimes dangerous ordeal for the mother.

Lastly in considering the indications for craniotomy should be mentioned that rather a large group of cases where the child may still be living but where its ultimate survival is in great doubt regardless of how delivered and where any other operation greatly increases the risk of the mother. In this group should be mentioned those cases where uterine sepsis exists. In regard to this question I desire to quote Newell,[3] who says:

"No method of abdominal delivery is safe in cases of virulent infection of the uterus, and therefore, in these cases abdominal delivery is to be avoided, if delivery can be otherwise accomplished, craniotomy being the operation of choice in cases in which no other method of delivery through the pelvis is possible, even though the child be alive. The maternal mortality following craniotomy even on infected cases, is less than that following any other similar abdominal operation under similar circumstances, and the chances of the child, even if delivered by cesarean section, under these conditions, are rather poor, many children dying of infection a few days after birth. Therefore, the operator should not consider the interests of the child, but should perform craniotomy if the pelvis is large enough for the delivery of a mutilated child."

Williams[4] likewise states that:

"Although it must ever be the duty of the obstetrician to do his best to save the life of both mother and child, it is nevertheless conceivable that conditions may arise under which craniotomy upon the living child may not only be perfectly justifiable, but even imperatively demanded. . . . . If the mother is not seen until she has been in the second stage of labor for considerable time, and is already infected, classical or extraperitoneal cesarean section, as well as pubiotomy, is clearly contraindicated. In such cases the child should be sacrificed in the interests of the mother, as the only other safe method of delivery consists in cesarean section followed by hysterectomy, which inevitably entails complete abolition of the reproductive function. Again, if the child is in poor condition, as shown

by a too rapid or too slow heart beat, or by the passage of considerable quantities of meconium with a vertex presentation, its life is already in such peril that, against that of the mother, it is no longer entitled to serious consideration. Moreover, in country districts, where the physician is unable to summon sufficient assistance, and is without the necessary appliances for an aseptic operation, cesarean section or pubiotomy should not be undertaken and craniotomy becomes the operation of choice."

It would seem that there is but one solution to the problem of religious belief. In all cases where the best obstetrics seems to be the operation of craniotomy on a living child, then the relatives or friends concerned should have all the facts carefully placed before them. After we have attempted to explain to them the *pros* and *cons*, we can only abide by their decision, but our full duty to them has not been discharged until we have requested permission to perform craniotomy. In the handling of charity cases it is usually the rule to have all applicants for treatment in the maternity hospitals sign a statement which leaves all question of treatment to the hospital and in these instances the question of further permission is not necessary. But it is always well to know that such a permit has been signed or that proper permission has been obtained before beginning the operation of craniotomy.

Before resorting to craniotomy on a living child we should bear in mind that the extraperitoneal section as practiced by Davis and McPherson seems to offer a method of delivering the potentially infected cases with a high degree of safety; and those authorities who are advocating the low cervical section after transverse incision in the peritoneum and deflection of the bladder downward are obtaining results which bid fair to greatly reduce the indications for destruction of a living child.

As to the mortality of the operation of craniotomy, statistics vary widely. Dr. T. W. Markoe a few years ago published some records showing 12½ per cent mortality, but maintained that death was nearly always due to conditions present before beginning the operation or to the method of performing it and that such a high mortality was by no means necessary. DeLee[5] says: "There should be no mortality from craniotomy if it is properly carried out."

In a report several years ago by Voorhees[6] upon 96 craniotomies in the Sloane Maternity, there was a maternal mortality of 26.4 per cent; but the author calls attention to the fact that practically half these deaths were due to eclampsia and that many of the other cases were moribund from various causes when the operation of craniotomy was begun. No deaths could be attributed directly to the operation itself.

Among the contraindications to craniotomy might be mentioned first of all a pelvis so markedly contracted as to offer a true con-

jugate of less than 5 or 6 cm., as in such cases with an average sized child there will be experienced marked difficulty in effecting the delivery and it may be quite impossible of accomplishment.

A previous craniotomy should stand out very strongly as a contra-indication to a second one. In other words no obstetrician is at all excusable if he allows a patient in his charge to reach the stage needing a craniotomy the second time at least for pelvic disproportion. The previous craniotomy should be a warning signal, and a timely version or cesarean section should be performed in order to avoid the necessity of further loss of life. Then possibly there are a few cases of pelvic tumors or cervical disease or scars which offer insurmountable obstacles to craniotomy.

In preparing for this operation in addition to the usual antiseptic precautions there are at least a few conditions which should be fulfilled. The cervix should be fairly well dilated or easily dilatable, though of course the size of the fetal head is to be greatly reduced and full dilatation is not of the same importance as in an ordinary forceps delivery. Yet, if the craniotomy is done as we often see it done and if some of the obsolete instruments are used that are still being used, there is grave danger of serious injury to a cervix which is not well dilated.

Catheterization as in all obstetric operations is of very great importance. One of my cases gave me a very lasting impression of this, in that catheterization relieved me of possible blame for an injury which was present before I began the craniotomy. The catheter passed into the meatus properly but entered the vagina through a large laceration produced in attempts at forceps delivery before the patient came under my care.

Then unless the head is low down or very firmly impacted it is always well to have an assistant hold it firmly through the suprapubic region while the operator perforates, as it sometimes moves about to such a degree as to markedly increase the difficulties and dangers.

As to the instrument of choice it seems that most operators prefer the Tarnier basiotribe. It offers a triple combination of an excellent perforator, crushing apparatus and tractor all in one instrument and in my own experience is far superior to any other device. In addition to having the triple combination in one instrument the Tarnier basiotribe greatly reduces the probability of injury to maternal soft parts by splinters or edges of cranial bones and rarely ever slips off.

Once the perforator has entered the cranial cavity it should be carefully but positively introduced down to the medullary portion of the brain and moved about in such a manner as to quite completely

destroy the vital areas of the brain or the very disconcerting condition may arise of having the child delivered still alive. I have seen two cases in which perforation had been done and the head markedly crushed and still the babies made efforts to breathe after delivery. Authentic cases are on record of the babies living for hours and even days and one case lived for years as an idiot.

Within the past few months a case was brought to my attention where the perforator had been introduced and the baby delivered by high forceps; the child is now alive and well at two years of age. The child only shows a small scar over the area of the anterior fontanelle and to my mind it is altogether likely that the perforator was inserted between the scalp and cranium and that the cranial cavity was not entered, yet these cases serve to illustrate what may happen and to warn us against depending on mere perforation. The fingers should always be a guide for the perforator and an attempt should be made to perforate near the pubis as this will reduce the dangers of injury to the mother. In using the Tarnier basiotribe an effort should always be made to insert the perforator deeply and to apply the blades high on the sides of the head in order that the possibility of their slipping off may be reduced to a minimum. Also it is well to screw the locking device down quite firmly as in doing so the head is being reduced in size and the dangers of the instrument slipping off are still further reduced.

SUMMARY

1. Craniotomy is an operation we should have no hesitancy in deciding upon in all cases where the child is dead and there are no insuperable obstacles to pelvic delivery of the mutilated child.

2. Craniotomy upon a living child may at times be indicated if there exists little or no hope of its ultimate survival and the mother would be seriously jeopardized by any other method of delivery.

3. The operation *per se* should carry with it no maternal mortality.

4. With the safety of cesarean section in its various forms developed to where it is today, a craniotomy performed upon a living child always represents improper care either by the operator or his predecessors on the case.

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(1) Craniotomy of the Dead Child, *J. B. DeLee*, Med. News, lxix, 374. (2) Prin. and Prac. of Obstetrics, *J. B. DeLee*, Ed. 3, 1041. (3) Gyn. and Obst. Mono., *D. Appleton & Co.*, 1921, p. 210. (4) Obstetrics, *Williams*, Ed. 4, p. 501-502. (5) Ibid. (6) Craniotomy, *Voorhees*, Am. Jour. Obst., xlvi, p. 765.

NEWTON CLAYPOOL BLDG.

(*For discussion, see p.* 421.)

DOUBLE SALPINGOOOPHORECTOMY WITH PARTIAL AUTO-OVARIAN TRANSPLANTATION, FOLLOWED BY TWELVE YEARS OF MENSTRUATION, A NORMAL PREGNANCY AND AN UNCOMPLICATED MENOPAUSE AT FIFTY-ONE YEARS OF AGE*

By William Seaman Bainbridge, Sc.D., M.D., C.M., New York City

CASE REPORT

C. S., thirty-nine years of age; married. January, 1905, I first saw this patient in consultation with Dr. W. T. Scovil of Richmond Hill, New York, to whom I am indebted for the postoperative history of the case. At that time the patient was suffering from double salpingooophoritis, old pelvic abscesses and peritoneal adhesions, the result of two miscarriages.

Operation was advised and performed January 10, 1905. The operative findings confirmed the clinical diagnosis. Extensive adhesions matted together practically the entire pelvic viscera. Ovaries and tubes formed part of an inflammatory mass which consisted largely of multiple tuboovarian abscesses. In removing this mass a complete ablation of the tubes and ovaries was necessary. The patient, with great desire for a subsequent pregnancy, had exacted a promise from the surgeon before operation to conserve in every possible way the ovarian tissue, even if some risk proved necessary. This phase of the matter was stressed by both the patient and her husband.

After the tubes and ovaries were excised, in the mass of pus was located a small piece of ovary, about half the size of the terminal phalanx of the little finger. This piece was carefully removed, grafted at the stump of the tube, in the cornu of the uterus and covered with an omental flap. The abdominal incision was closed, except for a small tube drain, at the lower part of the wound. This was dispensed with in a week.

Convalescence was uneventful. Four months later the patient had a regular menstruation and one and a half years subsequent to the operation had a normal labor and bore a healthy child. A year later the husband died. The postmenstrual life, after being reestablished, was quite regular and normal. At fifty-one years of age menopause occurred, uncomplicated by any distressing mental or physical symptoms and the mother and child are living and well today.

Since the completion of this case history, an article on ovarian transplantation, by Dr. W. E. Estes, has appeared in the *Medical Times* of May, 1922. The author of the article reports a pregnancy six years ago following the removal of the ovaries and the reimplantation of a part of the ovarian stroma, directly at the inner opening of the fallopian tube, in the horn of the uterus. The site of the graft and the technic of the operation, as described by Dr. Estes, are practically those used by the writer of the present paper in numbers of cases during sixteen years of ovarian transplantation when the tubes were removed.

34 Gramercy Park. (*For discussion, see p.* 423.)

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TRANSPLANTATION OF THE CERVIX*

By W. Wayne Babcock, M.D., Philadelphia

ABOUT 1905 I was consulted by a woman of twenty-six years, who had been married six years and whose chief complaint was sterility. In this patient the cervix was long, conical, much invaginated, anteflexed, and the anterior wall was short so that the os uteri was close to the introitus. It seemed possible that the elongation and position of the cervix might account for the sterility, and an operation

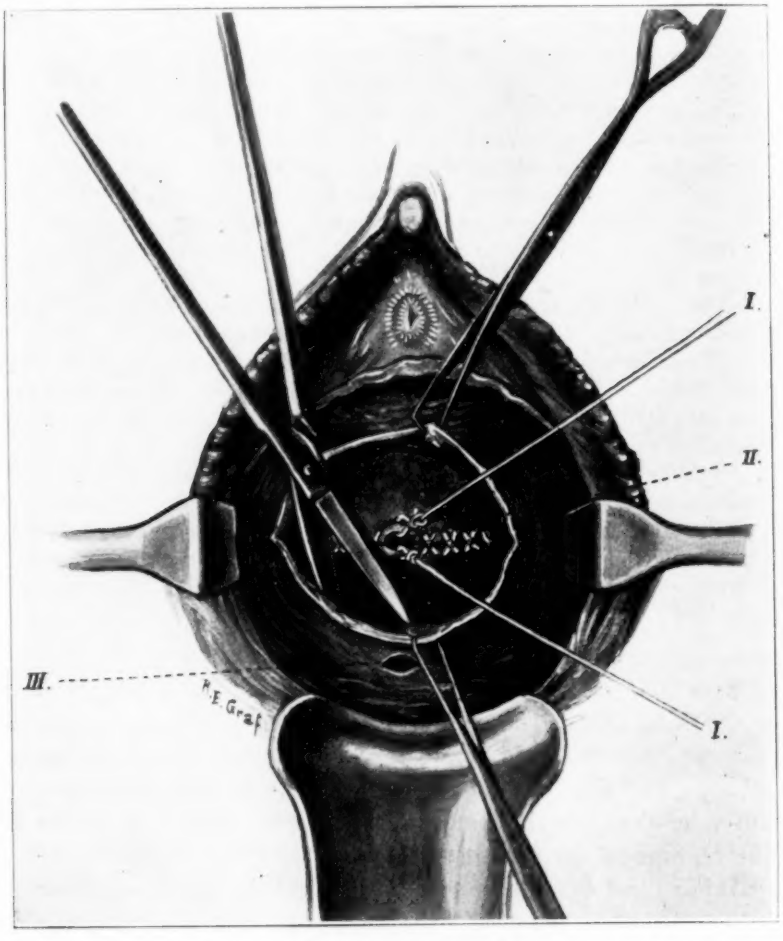

Fig. 1.—The cervix has been well freed from its overlying mucous membrane, a transverse laceration corrected, and guide sutures *I, I* introduced. The incision for the new os is shown at *III*. Often a much larger posterior incision is necessary and a much larger island of mucosa about the os *II* is left.

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to transplant the cervix well back in the vaginal fornix was suggested. Under anesthesia a transverse elliptical incison was carried about the cervix, leaving a small island of mucous membrane around the os, and the vaginal wall freed from the rest of the cervix. A small transverse incision was then made well back in the vaginal fornix and the mucosa between the incisions freed by blunt dissection. By sutures fastened to the island of mucous membrane about the os passing through the first incision, under the mucous membrane and out of the incision in the fornix, the cervix was pulled back through the posterior incision and fixed by carefully uniting the mucous edges.

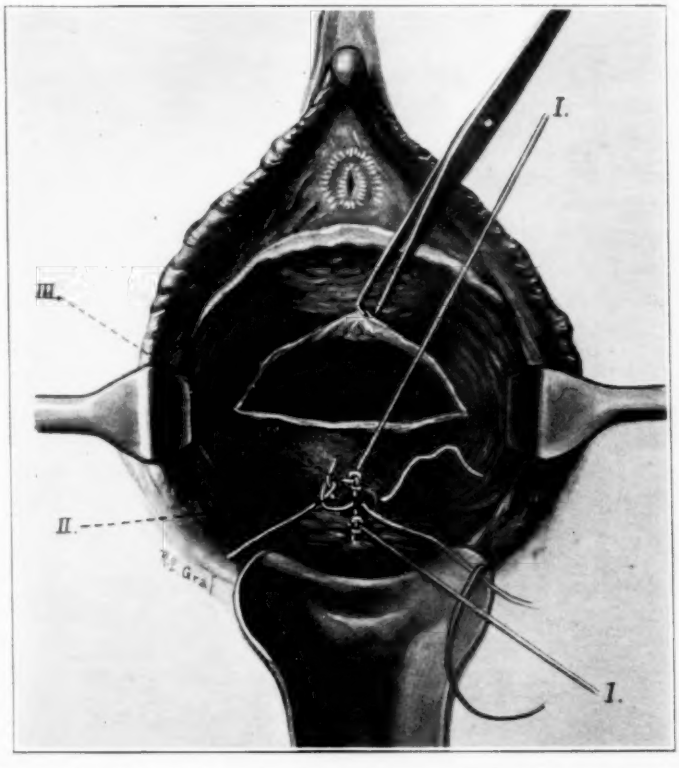

Fig. 2.—The cervix has been drawn by the guide sutures *I. I* to its new location, and the mucous edges are being approximated.

The anterior opening was closed by interrupted sutures, and the operation completed by introducing a supporting pack of iodoform gauze.

The postoperative course of this patient was not complicated, and not long afterward she returned to her home in England, became pregnant and was delivered of a healthy living child. Since this time she has borne a second child. The operation, which is a rather simple one, consists of a posterior submucous transplantation of the cervix, which may or may not be associated with a trachelorrhaphy, amputation of the cervix, or a shortening of the uterosacral ligaments.

The amount of mucous membrane left upon the cervix varies with the amount of invagination of the cervix that the operator wishes to produce, and also upon the condition of the cervix.

This operation may be indicated in:

1. Superinvagination of the cervix indicating operation where, owing to the small size of the uterus or other reason, amputation of the cervix is undesirable.

2. In certain cases of anteflexion of the cervix or anteposition of the cervix or uterus.

3. In certain cases of retroversion of the uterus favored or maintained by a short anterior vaginal wall, with anteposition of the cervix, and possibly also elongated uterosacral ligaments.

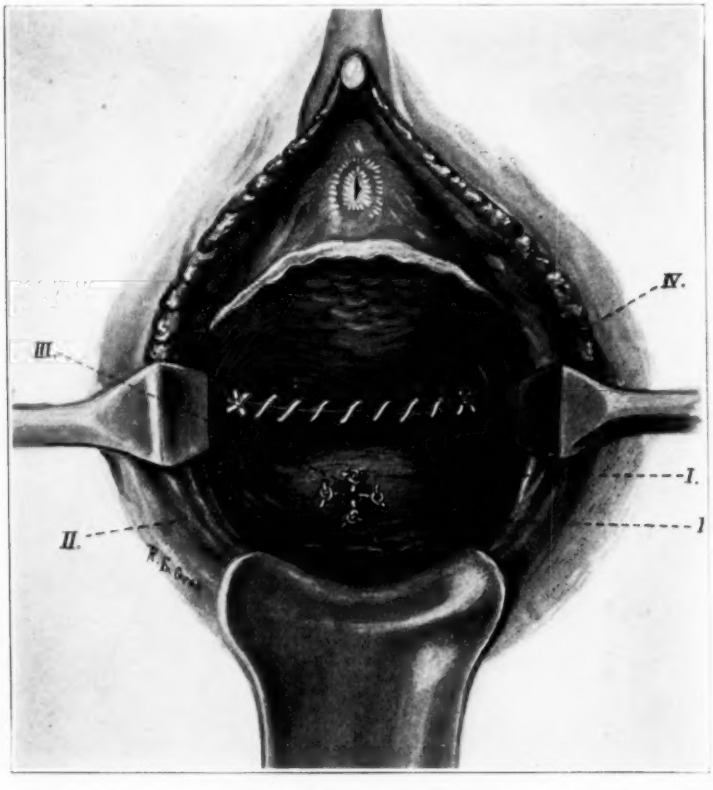

Fig. 3.—Both incisions closed, completing the operation. To further lengthen the anterior vaginal wall the anterior incision should be sutured in a vertical instead of a transverse direction.

4. In certain cases as a part of the operation for prolapsus or decensus uteri. The high posterior attachment to the uterosacral ligaments obtained serves to maintain the anteflexion and high position of the uterus in the pelvis.

5. As a part of the operation of amputation of the cervix to lengthen the anterior vaginal wall and to give added support to the cervix.

6. To facilitate the reconstruction of a mutilated cicatricial or adherent cervix, where a new cervical covering of healthy nonadherent mucosa is not readily available without the transplantation.

7. As a part of the operation of vaginal interposition.

The transverse incision over the culdesac may be used to gain entrance to the pelvis for associated intraabdominal work, and its length will obviously vary with the necessities of the particular case. The operation is conservative, easily carried out and seems to have a special, although perhaps limited, field.

Technic.—Usually it is easier to make the posterior incision first. With the patient in the lithotomy position and a weighted vaginal speculum in place, the cervix is grasped by a tenaculum forceps pulled well forward and the transverse incision through the mucosa of the fornix made. By blunt scissors dissection the submucous tissue is liberated forward to the cervix. The cervix is encircled by an incision well liberated, and after any necessary plastic work, by guide sutures introduced through the posterior incision, it is pulled back in place and the mucous edges approximated. Laterally the sutures may obtain added support by properly catching the uterosacral ligaments.

The anterior incision, if it is desired to further lengthen the anterior vaginal wall, is closed in an anteroposterior direction by sutures that should catch also the anterior uterine wall to prevent the formation of a dead space. It is obvious that the operative technic will be modified by the peculiarities of the particular case and by any necessary associated operations.

2033 WALNUT STREET. (*For discussion, see p.* 424.)

THE PERNICIOUS EFFECTS OF THE USE OF STEMS IN THE UTERUS AND THE DANGER OF INTRODUCING SOUNDS AND OTHER FOREIGN BODIES WITHOUT PREPARATION*

BY JAMES N. WEST, M.D., NEW YORK, N. Y.

I VERY much desire to do something toward the prevention of the disease and suffering which come oftentimes as a result of the introduction of stems and other foreign bodies into the uterus and leaving them there for a considerable length of time. The use of stems in the uterus is a procedure fraught with so much danger that I cannot conceive why any surgeon with moderate instruction would resort to it.

About thirty-five years ago, the use of intrauterine stems was at its zenith, but about the time I was an interne in the Women's Hospital, in 1894, it was on the decline. It was considered in those days quite the thing to invent some variety of the uterine stem for anteflexion,

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dysmenorrhea and sterility. But their use was on the decline for the reason that it was found to be an unsafe procedure which often resulted in parametritis, pelvic abscess, peritonitis, endometritis, and sometimes death, all of which the patient risked by this treatment for the relief of a minor condition. Furthermore, it was based upon a false conception of the cause of dysmenorrhea in anteflexion.

I am presenting for your inspection a collection of twelve different kinds of intrauterine stems, and although you would hardly think it, the inventor of each of these stems considered that he had added something to the sum total of gynecology that would increase his reputation and aid in the relief of suffering women. This form of treatment was dying a natural death on account of its inherent viciousness, but recently there has been a revival in the form of a pessary having a central stem fixed into a little saucer-like base, and with its intrauterine end spread out somewhat in the shape of a stretched out hair pin. The two intrauterine limbs of the stem are supposed to extend across the fundus and in that position to retain the stem in the uterus by their resilience. This stem is used for the prevention of conception and has no name. I have seen a good deal of disturbance as a result of its use and have removed several stems in my office. I am presenting herewith one case which illustrates what the use of this stem may do.

Mrs. J. I. J., age twenty-five, married six years, three children, oldest five years, youngest ten months. Normal deliveries. Admitted to Post Graduate Hospital, March 18, 1919.

Two months before admission the patient consulted a doctor for prevention of conception. He introduced an intrauterine stem to be left permanently. In the early part of March she began to complain of severe pain in the pelvis with chilly sensations alternating with high fever. The diagnosis read, pelvic cellulitis with pus formation in front of the uterus and left broad ligament. The patient was treated with an ice bag to the abdomen and with hot douches.

She was operated upon March 24. A vertical incision was made through the left rectus muscle nearly to the horizontal ramus of the pubes. A cavity was encountered containing a large quantity of pus. An incision was made through to the vagina between the bladder and uterus through which a rubber tube was brought from the abdominal incision into the vagina.

The patient was discharged improved June 28th. There was still an abdominal fistula which discharged from time to time a small amount of pus. Readmitted Aug. 8, 1920, with a double pyosalpinx and abscess of left ovary with sinus of abdominal wall. Operation August 9. Dissection of sinus. Removal of left tube and ovary, right tube and appendix. Drainage with iodoform gauze through the culdesac. Discharged Sept. 11, 1920. Improved. There still remained a small abdominal fistula.

This history of danger of death, of suffering, and permanent sterility, dates from the introduction of an intrauterine stem for the prevention of pregnancy.

The use of intrauterine stems for anteflexion still exists to quite an appreciable extent, but having heard the discussion of the subject

years ago, and having seen that the majority of gynecologists have given up their use, it occurred to me that there must be some reason why men continue such an archaic, dangerous and pernicious form of treatment. I finally have assumed that it is the result of ignorance, but there must be some authority in works of gynecology for the practice. To clear my mind on this subject, I have looked up the subject in several text books to see what position was taken by the authorities in regard to the use of stems. In some I find a most cursory mention of their use for the relief of dysmenorrhea of anteflexion, and in some the subject is not mentioned.

I herewith present some epitomized references.

Montgomery, Gynecology, 1912. "Twenty-five years ago the employment of the stem pessary was the favorite method of overcoming an anteflexion, etc. The objection to its use is that it is a source of irritation, affords constant danger of infection to the uterine mucosa and may lead to serious trouble."

Hirst, A Textbook of Diseases of Women, 1905. "An intrauterine stem pessary which would seem to be the most suitable implement for the correction of anteflexion cannot be recommended, for the prolonged retention of any foreign body in the uterine cavity predisposes to infection of the endometrium and to secondary infection of the tubes and ovaries."

Graves, Gynecology, 1918. "As has been stated the use of intrauterine pessaries is unsurgical in principle and may be followed by inflammatory processes in the tubes, of which we have observed two instances, nevertheless, even with this risk the procedure is regarded as justifiable and is very widely employed. If applied to the proper cases the results gained by pessaries both for dysmenorrhea and sterility are comparatively good. The pessary is left in from six weeks to two or three months. It must be very carefully watched by the attending physician, and should be removed at once if undue leucorrheal discharge or pelvic pain appears."

Crossen, Operative Gynecology, 1915, advocates its use.

There is no occasion for further quotations. A general practitioner seeking for a means of relieving sterility and dysmenorrhea due to anteflexion, turns to his work on gynecology, his answer will be in accordance with the book which he happens to have upon his shelf. If he turns to Crossen he gets advice to use the intrauterine stem. If he turns to Montgomery, he finds the subject mentioned and is advised not to use a stem. If he turns to Graves, he is told to use a stem but that his patient will be in grave danger from its use. If all of these works are read, he will be bewildered, but if he is a man of ordinary judgment he will not use a stem. The same thing which applies to the use of the stem for anteflexion and sterility, applies with still more force to the stem now being used to prevent conception. The prevention of conception in certain cases is a humane and proper thing, although not always legitimate, but the use of the intrauterine stem is an extremely dangerous and improper method. I wish to thoroughly discourage the use of intrauterine stems for any purpose whatever and I trust that an expression of opinion on the part of members of

this Society may be given on the subject in order that the opinion of the writer may be reenforced by the greater authority of opinions of members of this Society.

The same thing which applies to the use of intrauterine stems applies to other foreign bodies in the uterus.

In doing dilatation and curettage one should always wipe out the cervix with tincture of iodine so as not to carry the organisms which are found in the cervical canal into the body of the uterus and vaccinate them there with the curette. This applies to any other intrauterine instrumentation, except the use of forceps in delivery.

I would advise against leaving uterine packing more than thirty-six hours and then the use of iodoform gauze from which the iodoform has been washed by wringing out in water three or four times.

Finally, the ideal surgical relief for dysmenorrhea, which is practically uniformly successful, is a thorough dilatation of the cervix and Emmet's amputation to a point one-third of an inch below the internal os. This procedure has resulted uniformly in the relief of dysmenorrhea of anteflexion and in many cases has relieved sterility.

71 WEST FORTY-NINTH STREET. (*For discussion, see p. 425.*)

RENAL TUBERCULOSIS: DIAGNOSIS AND TREATMENT*

BY H. DAWSON FURNISS, M.D., F.A.C.S., NEW YORK, N. Y.

DIAGNOSIS

AS MY work in urology has been entirely on the female, points germaine to renal tuberculosis in women only are discussed.

If one has in mind tuberculosis whenever a patient has hematuria, pyuria, frequency or renal pain, and clings to this idea until proved, or disproved by finding another cause for the trouble, he will miss few of the tuberculous cases. In the very early, and occasionally the very late cases, one may fail, but the majority are so plainly labeled tuberculosis that there is little excuse for error.

Renal tuberculosis is a chronic disease and slow in development. In my cases symptoms referable to the condition existed before diagnosis three months in one case and thirteen years in another, with an average of approximately four years. In 20 per cent there was a history of other previous tuberculous lesions that often antedated by a number of years, the symptoms of the renal trouble. Three of these patients had bone tuberculosis that had healed five years before the onset of urinary symptoms. It is possible that the kidney lesions

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occurred during the acute stage of the bone trouble and remained quiescent all this time. In 15 per cent there were healed or active pulmonary lesions and in two the pulmonary condition overshadowed the renal. In three there had been an old cervical adenitis. In none was genital or peritoneal tuberculosis discovered prior to operation, but one patient succumbed two years after nephrectomy to pulmonary and peritoneal tuberculous disease.

Vesical symptoms are usually the first complaint and in young virgins frequency of urination should excite a suspicion of tuberculosis. The irritation is at first slight but becomes progressively worse. The frequency is nocturnal as well as diurnal, in this particular differing from trigonitis and chronic urethritis. Slight pyuria may be noted early; later it is always present and rather well marked. Hematuria is often noted early, lasts usually a few days, and is I believe nearly always of vesical origin and associated with an acute exacerbation of the vesical symptoms. Later there is always a small amount of blood from the vesical granulation and ulcer, and rarely any from the kidneys. The cases vary in the degree of vesical involvement and consequently in the severity of the symptoms. Some have almost complete destruction of the kidney with only moderate bladder disturbance, and with others just the reverse occurs.

Renal pain, usually in the form of nephritic colic, at times a dull ache, occurs in 15 per cent. This is due to intermittent obstruction of an already indurated and strictured ureter.

Temperature was noted in only a few, and with these there was perinephritic abscess, ureteral obstruction, and lesions in other organs. The general health was good in 50 per cent, fair in 35 per cent, and poor in the remaining 15 per cent. When poor, bilateral involvement, renal insufficiencyy, or disease in other organs should be suspected. It is surprising how little uncomplicated unilateral renal lesions affect the general health. At times patients with unilateral renal tuberculosis have a toxic infection of the other kidney, which clears after nephrectomy.

Though one may suspect tuberculosis from the history, the diagnosis really rests on laboratory, cystoscopic—and at times x-ray, and other methods of physical diagnosis. The very early, and at times the very late, cases are the most difficult to diagnose.

The finding of tubercle bacilli in the catheterized urine of a woman is almost proof positive of tuberculous disease of at least one kidney. This statement is qualified with "almost" for the reason that tubercle bacilli are at times excreted by the healthy kidney without damage to itself. Should there be pus, blood, and impaired function of the kidney from which tubercle bacilli are excreted, a diagnosis of renal tuberculosis is warrantable. The bacilli can be found in at least 85

per cent of the patients either by slide preparation or guinea pig inoculation. I have had two instances of failure of guinea pig inoculation when the bacilli were discovered by staining. In some of the late cases, especially those where the ureter has become occluded, one fails to find the bacilli.

In the majority of our patients the cystoscopic appearances are so marked that to the experienced examiner they are as significant as pulmonary signs are to the skilled internist. There is induration of the ureteric meatus, in the early cases slight, but in the advanced quite marked. The orifice becomes irregular, the lips losing their elasticity and being rigid and nodular. There are varying degrees of perimeatal involvement, from simple induration to actual ulceration. The involvement of the ureter produces a shortening and consequent retraction of the meatus, often so great that it will be three-quarters to an inch behind its fellow. There is usually a "kissing" ulcer on the anterior wall, slightly lateral and on the opposite side from the affected ureter.

Except in greatly advanced cases the rest of the bladder is uninvolved—in these advanced cases the bladder capacity is almost *nil*, the outlines are so destroyed by ulceration that one part cannot be differentiated from another.

Should tubercle bacilli be found in the bladder urine, and the disease be so slightly advanced that changes have not been produced in the bladder that would indicate the kidney affected, both ureters should be catheterized and the origin of the bacilli determined. In those showing characteristic ureteral changes the suspected side is not catheterized but only the healthy one to prove that it is not diseased. We feel that catheterization of the known tuberculous side is harmful and that it gives no information not to be otherwise found. The combined function of the two kidneys is determined by phenolphthalein and blood chemistry, and the individual by injecting indigo carmine intravenously and watching the elimination through a simple cystoscope. Frequently the ureter of the healthy side is widely dilated; with the meatal lips flabby and not indurated, which will distinguish it from the tuberculous type. This is a retrograde dilatation due to back pressure, which back pressure is due to an almost constantly contracting bladder.

Where the disease is at all advanced the ureter of the involved side can usually be felt *per vaginam*, which is of value in determining the side or sides affected when cystoscopy is impossible. The size of the kidney is not to be taken too seriously in diagnosis. Very frequently the tuberculous kidney is not enlarged, is often reduced in size, and the healthy one may be the larger as a result of compensatory hypertrophy.

While the disease can be usually diagnosed by laboratory or cystoscopic methods, there will be found a few instances in which this is impossible; then x-ray examination may be of value in showing up this condition.

When the bladder is so involved that one is not able to determine the side affected, some have advocated exploratory operation upon the bladder to catheterize the ureter, or operation upon the kidneys. In such advanced bladder disease there is also such involvement of the ureters that they can be palpated *per vaginam* and one determine the side or sides affected. X-ray may be of possible value. I should hesitate to do an exploratory operation on the kidneys and then only when the general health was good or fair, the combined urinary excretion of phenolphthalein, and the blood chemistry near normal; I should explore the supposedly healthy kidney first. The condition of the ureter would more often indicate tuberculosis by its thickening than an inspection of the kidney itself, for many tuberculous kidneys have no surface indication of disease. If there was doubt, a specimen of urine could be obtained by ureteral catheter introduced through a small slit in the ureter or the pelvis. If such urine was pus-free, the probabilities would be against tuberculous infection. If pus is found, a specimen should be obtained, the wound closed and the case kept under observation, until the question of the presence of tubercle bacilli could be determined. Fortunately one is seldom called upon to make an operative diagnosis. In the majority of instances a more accurate and comprehensive diagnosis can be made by the other methods above enumerated.

TREATMENT

Except in cases of miliary tuberculosis, renal tuberculosis is usually unilateral, at least at first. In the consideration of treatment of tuberculous kidneys, it is necessary to know the natural history and course of the disease.

The majority of the cases will progress to complete destruction of the kidney. A small number of these will have the kidney shut off from the urinary tract by stricture formation in the ureter, and of these a few will have the disease become stationary. It is this last class that are the so-called cures, but they remain potential sources of future trouble. With the cessation of drainage into the bladder the cystic symptoms are relieved.

Unfortunately with the progression of the kidney destruction there is usually an advance of the disease in the bladder which becomes severely ulcerated and greatly contracted, making the patient miserable and at times life almost intolerable. In neglected cases the second kidney may become involved either through the blood stream

or by the ureter. The toxins from the tuberculous kidney are often the cause of nephritis on the other side.

A small percentage of the patients develop perinephritic abscesses.

The accepted treatment for unilateral renal tuberculosis is nephrectomy, providing there is no contraindication in other concurrent disease or renal insufficiency. The earlier the disease is eradicated, the better the chances of preventing further spread and of relieving the bladder condition. With one patient, who had tubercle bacilli in her right kidney urine (found three times) and none in the left, I was greatly chagrined to find a kidney with no discoverable tuberculous change. Since then I have made it a practice not to remove kidneys discharging only tubercle bacilli. There must be other evidences of involvement, such as pus, diminished function, thickened ureter, and ureteric meatal changes. As the disease is essentially a slowly progressive affair, one can well await the development of more evidence to warrant kidney removal and this without detriment to the patient.

With bilateral involvement some authorities have advocated removal of the kidney with the more advanced lesion. This does not seem warranted unless the better kidney has only slight lesions with good function and its ureter, with the part of the bladder surrounding it, is uninvolved. Even then, unless the patient was suffering acute renal pain, or there was vesical intolerance, I would withhold operation.

In regard to operation the chief questions involved are drainage and treatment of the ureter. Unless there has been soiling of the wound from rupture of the kidney, or persistent oozing, I refrain from drainage, and when draining use rubber tissue for twenty-four hours for oozing. If the wound has been soiled a split rubber tube is used for twenty-four or more hours, depending on the degree and character of the soiling. When there is perinephritic abscess the kidney should be removed if not unduly risky. If there are great technical difficulties drain the abscess.

Unless there is marked involvement of the ureter, or low stricture with dilatation above, the ureter is divided with a cautery, ligated and dropped. Under the other conditions, the ureter is removed to a point just above the bladder. In my experience a sinus is as apt to form after ureterectomy as after high division.

In one patient on whom I did a ureteronephrectomy there developed a sinus, subsequent involvement of the second kidney, a progression of the cystitis, and discharge of urine from the bladder through the stump of the ureter into the sinus and onto the skin. In this particular case the ureterectomy permitted discharge from the bladder which otherwise might not have occurred.

About one-third of the patients develop a sinus, and this seems to

follow in the drained as well as the undrained. Nor does resection of the ureter, except in the class of cases above mentioned, seem to favorably influence this complication. In the drained cases the sinus is noted usually during the hospital stay; in the undrained it makes itself manifest about the fourth week when they are home. This gives the undrained cases a seemingly apparent, but false, advantage. While a disagreeable complication, I have seen no harm come from it. They close spontaneously on the improvement in the general condition, though this may take from a few weeks to several months and occasionally a year or more.

In nearly all the patients there has been a postoperative rise of temperature, lasting from 24 hours to several days, with an exacerbation of all other tuberculous lesions. This I have interpreted as a tuberculin reaction, exactly similar to that after injection of tuberculin. With the first that had a severe reaction I opened the wound on a hunt for pus. The hunt was unsuccessful but the wound healed slowly with a sinus and a hernia, the only one I have had sufficiently well marked to be troublesome.

The after-treatment of these patients consists in measures to build up the patient's general health, to spare the remaining kidney overwork, and to clear up the cystitic lesions. Good results have been obtained by irrigating the bladder with boric solution in the acute stage, 2 to 3 per cent carbolic acid later. For persistent ulcers fulguration hastens the healing.

For the bilateral, or otherwise inoperable, cases much can be done for the bladder comfort in the way outlined for the postoperative vesical treatment.

Renal tuberculosis is usually unilateral, and when so, there is a favorable response to nephrectomy in the relief of kidney and bladder discomfort, and a betterment of the general health.

54 East Forty-Eighth Street.

(*For discussion, see p.* 430.)

BLADDER SURGERY IN RELATION TO THE FOURTH ERA OF SURGERY*

By Robert T. Morris, M.D., F.A.C.S., New York, N. Y.

HUXLEY said that science committed suicide the moment it adopted a creed.

In the course of development of the third or pathologic era of surgery during which the methods of asepsis and antisepsis made greatest advance, a number of creeds became established. The rubber glove was accepted as belonging to the ritual of procedure in bladder surgery. It distinctly lessened the surgeon's tactile sense which is required to such a high degree when he is working out an enlarged prostate gland or finding minute fragments of concretions or determining the character of several kinds of changes in the bladder wall.

The fourth or physiologic era of surgery includes the idea of doing the gentlest and most rapid work without injury to the natural protective resources of the individual. In cases in which infection of the bladder has already occurred, well prepared hands do not carry any additional bacteria to the bladder in any harmful way. In cases in which there is no infection of the bladder at the time of operation, the more rapid gentler work that is done by well prepared bare hands lessens the degree of injury to normal tissue cells and conserves their natural defense.

Another injurious part of the technic of bladder surgery belonging to the third era included the creed that drainage tubes and connections with a sterile bottle beneath the bed were essential desiderata. As a matter of fact the bladder naturally resents the presence of any such shocking contrivance and patients were made very uncomfortable beside being distinctly injured at times by the addition of this feature of the management of their cases. A certain kind of drainage device is necessary in many cases in which posture will not suffice for giving a sufficient degree of natural drainage. A retention catheter must sometimes be used but when that is the case, it should be the smallest and softest one procurable.

For suprapubic drainage I do not feel that anything is required beyond a small drainage wick excepting in situations in which we are obliged to employ packing for the control of hemorrhage. In place of the cumbersome and distressing tube and bottle arrangement after suprapubic cystotomy, a very small drainage wick is preferable. The

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wound about the wick is protected by a couple of layers of iodoform gauze. Upon this gauze is placed sphagnum moss for purposes of absorption of fluids from the bladder or wound.

Sphagum moss is inexpensive and may be purchased by the bale from any dealer in florist supplies. It is hard and dry in the bale, but any lot which is to be used for bladder dressing purposes may be first soaked in a tub of saturated solution of borax, squeezed as dry as possible and then kept in large jars ready for use. As a matter of convenience, handfuls of the sphagnum moss may be twisted up loosely in a single thickness of gauze and these little "balls" of moss are easily applied for suprapubic drainage purposes. They may be thrown away several times in the course of a day if necessary and a patient wearing this sort of drainage device may be sitting out of bed by the window reading his newspaper in comfort at the time when a patient with drainage tube and bottle accommodation is lying in distress in a bed to which he is confined.

In the fourth era of surgery which makes the least possible degree of drain upon the patient's strength we may choose the wick and moss drainage device. Sphagnum moss merely soaked in clean water and then squeezed nearly dry seems to have a certain inhibiting effect upon the development of microorganisms. Aside from any additional protection given by boracic acid or borax the layer of iodoform gauze which protects the immediate vicinity of the wound guards this area well enough.

Another feature relating to fourth era methods as opposed to those of the third era consists in discarding some of the beautiful and scientifically devised instruments for examination of the interior of the bladder by way of the urethra. If the patient were a horse and a dead one at that, this sort of instrumentation would represent a very high notch in artistic skill.

Our sentient patients, however, frequently sacrificed upon the altar of wonderful device and method, stand in abject terror of reapplication of cystoscopic methods in particular. There are situations in which there is no alternative. There are many other situations, however, in which a simple suprapubic cystotomy entailing almost no suffering may give all of the advantages obtained by way of elaborate urethral route investigations.

The third era surgeon's off-hand feeling commonly includes what seems to him a kindly act when he avoids suprapubic incision and in its place offers high class intraurethral observation and treatment.

The fourth era surgeon, however, equipped with simple ways for managing suprapubic cystotomy, is prepared to give his patient almost immediate comfort in an hour in some cases in which the suffering incidental to cystoscopic work might subject the patient's life to risk.

114 East Fifty-Fourth Street. (*For discussion, see p.* 431.)

THE SO-CALLED HERNIA IN THE MAMMARY AREOLA

A Contribution to the Possible Etiology of the Mamma Areolata and Vicarious Menstruation

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IT IS a well-known fact that phylogenetically young organs are prone to malformation in their ontogenetic development. This is shown, for example, by the frequent malformations of the genital organs. Another phylogenetically young organ, closely connected with the reproductive system, is the human female breast. Polythelia, misplaced mammary tissue,* malformations and gynecomastia are evidences of the atavistic tendencies present here and the frequency of such malformations teaches us how young an organ the human breast must be. In fact the mammary gland of the human female is unique in the whole order of mammals, both as regards the mechanism of its development and the stages of its growth. This is best seen by a brief comparison of the mammary glands in the various classes of mammalia.

In the lowest form, the monotremata, who lay eggs and whose young when they reach the outside world are too young to suckle, not even nipples are present. In these animals the milk simply exudes from the skin of the abdomen of the female where the young can lick it up. In the next higher class, the marsupialia, nipples form, but the young are generally born at such an early stage of development that at first they are unable to suckle and the milk is expressed for them by muscles similar to that which H. Friedenthal has called the musculus expressor lactis.† In the carnivora the nipples are well developed, the young able to suckle energetically at birth, but except at the time of lactation the nipples are very inconspicuous and disappear under the fur. In some classes of the ungulata the nipples are more prominent but in none of the mammals until we reach the higher primates (gorilla, orang-utan, chimpanzee, and gibbon) do we see anything which would even suggest an areola. In the apes an areola and tubercles of Montgomery are present although small. In not a single class of mammals, however, except man, do we have any mammary gland enlargement until pregnancy and lac-

*One of the oldest cases in this respect is the one reported by Perkins in the Jour. Am. Med. Assn., 1921, p. 792, where secreting mammary tissue with a nipple was situated on the right buttock of a man.

†Beitraege z. Naturgeschichte d. Menschen. *Fischer*, Jena, 1910, etc.

tation occur. The human female is the only one who shows the growth of the mammary gland with the production of a fat pad on the pectoral muscles at puberty, as a definite secondary sexual characteristic, independent of pregnancy and lactation.*

Another human characteristic of the breast is the possibility of long continued milk production and the relatively slight retrogressive change which takes place after the lactation period. As this condition is, however, present also to a large extent in domesticated cows, and much less in wild cattle, we must see the explanation of this occurrence probably in functional overwork of the gland combined with a superabundant food supply. Such a capacity for increased milk production would seem to indicate an inherent strength of these organs had not Alfred Adler† shown definitely that weak organs are just the ones which may become modified and adjust themselves most easily to excessive demands put upon them.

These few facts of the phylogenesis of the human female breast explain why racial and individual differences and malformations, especially in the size, shape and form of the nipple and areola, are so very common. Doubtless, the customs and habits of the various peoples account for some of the racial peculiarities. The tight downward binding of the breasts practiced by some of the African tribes may, for example, be responsible in part for the bottle-shaped breasts found here.‡ Most of the differences, however, must be sought for far deeper and in fact can only be understood if apart from the phylogenetic principles involved; we also study the various stages of growth of the normal breast in the individual. These stages are well illustrated by the following diagram copied from *Stratz*, whose nomenclature I have also retained.

A. The Stage of the *Mammilla.* The slight amount of mammary tissue present here lies directly underneath the nipple and forms a flat, compact disc. (Too firm an attachment to the surrounding and underlying tissue at this stage will account for the malformation known as inverted nipple.)

B. The Stage of the *Areolamamma.* Even as early as the seventh or eighth years the growth of the mammary tissue bulges the areola upward. The nipple gradually becomes less prominent. This stage often lasts only a few weeks or months. It has erroneously been considered pathologic by some observers.

C. The Stage of the *Mamma Areolata.* The fat and breast tissue

*The development of the udder before lactation at times seen in domesticated, never in wild cattle, is a totally different structure histologically from the normal human female breast of puberty.

†*Alfred Adler*:—Studien ueber Minderwertigkeit von Organen, Urban Schwarzenberg, Berlin. Also translation by *Smith, Ely Jelliffe.*

‡*Ploss Bartels*:—Das Weib in der Natur und Voelkerkunde, Leipzig, Grieben. Ed. 8, 1905. Numerous other tribal customs causing changes in the breasts and other organs are also cited here and illustrated by drawings and photographs.

develop and the nipple and areola form a smaller, more convex dome on the surface of the breast.

D. The Stage of the *Mamma Papillata.* This represents the fully developed breast. The areola has been taken up again into the general convexity of the mammary gland.

In the yellow races stage *D* is practically always reached. In the protomorphous races, however, type *C* usually persists throughout life. In the white races type *D* represents the normal but at times type *C* persists.*

One form of this last type Hofstaetter** has recently reported in six cases in pure bred Arian girls as hernia in the mammary areola. He believes that the defect is caused by a lack of development or tonus of the smooth muscle fibers of the areola. In each case the areola bulged irregularly and a separation of the muscle fibers seemed palpable to Hofstaetter. The nipple frequently slanted off to one

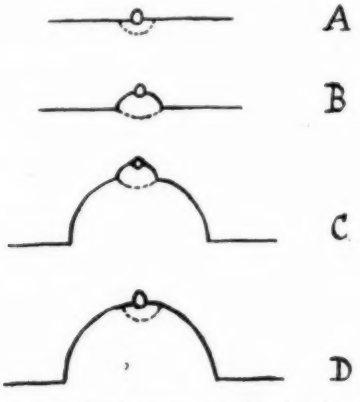

Fig. 1.—The four stages in the development of the female breast in the white races (schematic). (After C. H. Stratz.)

side and at times was not erectile. Before the development of the anomaly there were nearly always drawing pains in the breasts. In those cases in which menstruation is mentioned it was usually late and scanty. All of the girls had become very stout just before the onset of the deformity. Hofstaetter advises cold bathing, muscular exercise, alcohol washings, regulation of diet, and adhesive strips to keep back the bulging. In the advanced, or long standing cases, he thinks the prognosis is hopeless but possibly operative interference might offer some hope of success. At the same time Hofstaetter quotes Friedenthal as stating that the cause of the mamma areolata in some of the black races may be a hypertonus of the smooth muscle fibers. This, however, would most certainly be the type of areola

*See *C. H. Stratz*—Die Rassenschoenheit des Weibes. Ed. 4, Enke, Stuttgart 1903. Also, Die Schoenheit des weibl. Koerpers. Ed. 15, Enke, Stuttgart 1904, and Ploss Bartels—l. c.

***Hofstaetter*—Hernia in the Mammary Areola. Arch. f. Frauenkunde, viii, 105.

least predisposed to hernia and does not agree at all with Hofstaetter's previous remarks. Again, the yellow races seem always to have a mamma papillata, whereas, they show the least development of areola muscle fibers.

Hofstaetter's article interested me very much because of an identical, recent case of my own which shows that at least in some long persisting cases we are not dealing with hernia at all and a very different treatment and prognosis is indicated.

The case observed by me is that of a young unmarried woman of twenty-two (*T.M.P.*) blonde, pure bred Anglo-Saxon. She came to me early in 1922 complaining of backache and general malaise at the menstrual period, also nose-bleeding and tenderness and bleeding of the gums either just before or usually during her periods. These symptoms had been present at every period since her menstruation started at 13 years of age. The flow had come every three and a half to four and a half weeks. Once three years ago, after a cold, she had total amenorrhea for three months, during which time no vicarious bleeding was present. Family history negative. Examination showed a well developed young woman. Both breasts showed a mamma areolata, especially on the left side. The nipple here slanted toward the outside and even on irritation did not project at all above the level of the bulging areola. The hymen was intact, the uterus anteflexed, very slightly smaller than normal. The body hair was somewhat in excess of the usual female type, otherwise the physical examination revealed nothing abnormal.

As the patient did not have severe pains and told me she would soon be married, I prescribed benzyl benzoate for her dysmenorrhea and calcium chloride (by mouth or possibly as Afenil* by intravenous injection) for her vicarious menstruation.

The patient did not return for almost eight months. She then came to find out if she were pregnant as her period was a week overdue. She had been married four months previously. She had taken the benzyl benzoate when necessary, the calcium only one month, and as it had done no good, had ceased taking it. She told me that her epistaxis and tender gums had become less after the first month of her marriage and by the third month had disappeared altogether. At the same time she had had marked sticking pains in the left breast for about two weeks following the second period after her marriage. The following month she had had moderate pains in the right breast. A slight dysmenorrhea still persisted at times.

A gynecologic examination showed no signs of pregnancy, the hymen was torn, the uterus was the same size as before. The breasts, however, were changed. Both areola had flattened out considerably, especially the left side showed this very plainly. There was no longer the marked bulging of the areola which had been present before and the nipple stood out even without being touched. It reacted quickly and strongly to the slightest irritation.**

We have here then a case which duplicates, in practically all details, the six cases that Hofstaetter describes as hernia in the mammary areola but which improved as soon as sexual intercourse was established.† There can be no doubt, therefore, that we are dealing

*Afenil is a combination of urea and calcium and, as far as I know, the only preparation of calcium which can be used intravenously. It has had marked success abroad in cases of hemorrhage and various other conditions.

**Since then a reexamination has confirmed the absence of pregnancy.

†None of Hofstaetter's cases, with one exception, that of a young woman who seems to have developed the condition during pregnancy, were followed up to the time of marriage so that nothing can be said as to the possibility of a reaction such as occurred in my case.

in this case with an endocrine disturbance which can only be interpreted as one of diminished ovarian function stimulated to greater activity by sexual indulgence. As further proof for this viewpoint we must remember the small uterus, the hypertrichosis, and the amenorrhea lasting three months several years ago.

It would seem to me that the only logical explanation of all cases of persistent mamma areolata is that of insufficient ovarian function. Due to this the breast never reaches its full development but stops at an earlier stage. Furthermore, this explanation is the more easily tenable if we remember, as stated in the beginning, that the earliest mammals have no nipples at all and that only in the apes and humans do we have a differentiation of nipple and areola.

I would be more inclined, also, to attribute the occurrence of the mamma areolata in the protomorphous races to the same cause rather than to those mentioned by Hofstaetter. This may seem at variance perhaps with the general opinion about the pronounced sexual tendencies found in some of the black races but these opinions are mostly based on observations of the protomorphous races outside of their wild state. In such cases interbreeding with other races, change of environment and an abundant food supply, have totally altered conditions. Anyone who is familiar with the peculiar, and often extreme laws of sexual abstinence found in these races in their indigenous state, will realize that people with pronounced sexual proclivities would never make such laws. Besides, the negroes born in civilized countries do not, as far as my experience goes, have a mamma areolata, or at least only rarely. We see, therefore, even here no evidence against accepting an endocrine deficiency as the cause of a mamma areolata. If this deformity develops secondarily, especially after a woman has become very stout, I would also think of ovarian deficiency. The same is true in pregnancy where the activity of the ovary is much reduced.

In addition to the mamma areolata the vicarious menstruation in my case was also cured by marriage. This occurs at times and is mentioned in various instances in the literature, as by Scanzoni* who attributes the same curative power at times to conception and pregnancy. To be correct my case really showed not a vicarious, but a supplementary† menstruation as uterine hemorrhage also was present.

Generally, vicarious menstruation is regarded either as a perverted ovarian function or an increased ovarian function. The first explanation is given especially in true cases of vicarious menstruation with or without hypoplasia or total absence of the uterus, the second in cases of supplementary menstruation. However, that would not explain

*Cited by Roth, who will be found in the bibliography, on vicarious menstruation, at the end of the article.

†*Dorland*—Medical Dictionary and *Blair Bell*—System of Gyn. i, 374.

why we do not get vicarious menstruation after a total hysterectomy with retention of ovarian tissue. Neither would it account for the fact that such hemorrhages do not occur in the so-called normal cases. The ovarian hormone certainly acts on the whole body and produces a general hyperemia. This is shown by the increased tendency to hemorrhage in cases operated upon at the time of menstruation irrespective of the operative locality. In my case certainly we cannot possibly think of an increased ovarian function. As ovarian extract raises blood pressure it would seem rather that cases with vicarious menstruation have a defect or instability of the vascular system* or that possibly a constrictor element normally present in the ovarian extract is lacking.† As the breast is so intimately connected with the uterus and ovaries, this would also coincide well with the occurrence, in these cases, of a mamma areolata where the muscle fibers evidently have not contracted sufficiently. It would be interesting to have statistics on the condition of the breasts in cases of vicarious menstruation and vice versa, and I believe that such statistics would help to increase our knowledge of the endocrine action of the ovary, which at present is still known only very superficially despite all efforts in this direction made so far.

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*The coagulation time of the blood must also be thought of. It was normal in my case.

†The conception of vicarious or supplementary menstruation as a deficient ovarian function receives further clinical evidence from a case reported by E. H. Funk and A. G. Ellis in the "Report of the Jefferson Med. Coll. and Hosp.," 1915, vi, 136. In this case the woman had periodic bleeding (vicarious menstruation) from the mouth, associated with hypoplasia of the uterus and tubes and aplasia of the ovaries and mammary glands.

TOXEMIAS OF PREGNANCY FROM A NEW ASPECT

A Preliminary Report*

By O. M. Gruhzit, M.S., M.D., Detroit, Mich.

GREGORY MENDEL formulated in 1865 laws which govern transmission of hereditary characters from the parents to the offspring. Von Dungern and Herschfeld[1] demonstrated in 1909 and 1910 that the transmission of blood group characters obeys the same laws. In 1921 and 1922 Ottenberg[2] used the blood group characteristics of parents and their offspring as a means of identification of the parentage of the child.

Landsteiner[3] in 1901 postulated the presence of different agglutinating substances specific to each blood group. Decastello and Sturli[4] in 1902 and Hekton[5] in 1907 proved by the absorption method the existence of two cell agglutinogens and two corresponding serum agglutinins. Jansky[6] in 1907 definitely recognized four blood groups. This was confirmed by Moss[7] in 1910. Further, Von Dungern and Herschfeld showed that the agglutinogens of the red cells never occur in the child if not present in one of the parents. The blood group peculiarities are permanent throughout the life for each individual. In the embryologic development the specific agglutinating power of the red cells appears first and is present at birth, while the serum acquires the agglutinating power after the birth.[4]

It is universally known that the incompatible blood cannot be used for transfusion. The question arises whether a similar condition does not exist in a pregnancy where the mother's serum agglutinates the fetal red cells, and whether incompatibility of mother's and fetal cell elements does not have something to do with the toxemias of pregnancy.

With this in view, blood typing was undertaken to determine incidence of incompatibility of the blood of the mother and her offspring in normal pregnancy as well as in toxemias.

It is to be noted that in every case of eclampsia the mother's and baby's blood grouping is such as to produce agglutination of the baby's red cells by the mother's serum. On the contrary, not a single case of normal pregnancy showed a possible blood grouping which could result in agglutination of the fetal red cell elements by the mother's serum *in vivo* or *in vitro*.

Diagnosis of eclampsia clinically is at times very difficult and many

*This work was done at the Maternity Clinic of the University of Michigan Medical School, with the kind permission of Dr. Reuben Peterson, Professor of Obstetrics and Gynecology. Received for publication, December 13, 1922.

mild cases might be missed entirely, while other cases are easily mistaken for uremia, hysteria, epilepsy, or nephritis. It is just as easy to diagnosticate eclampsia where it should be diagnosed uremia, nephritis, etc., unless the clinical evidence is substantiated by laboratory findings. Eclampsia is more common than is usually thought, especially the milder cases which are not recognized as such. Theoretically there should be one case of eclampsia in about 170 pregnancies. In the University of Michigan maternity clinic, out of 1040 cases delivered during the last four years there were ten cases of eclampsia, i.e., one case of eclampsia in 104 deliveries.

TABLE 1

BLOOD GROUPING IN TOXEMIAS AND NORMAL PREGNANCIES

NUMBER OF CASES	MOTHER'S GROUP	CHILD'S GROUP
13	I	I Normal
10	II	II "
10	II	I "
2	III	I "
3	IV	IV "
1	IV	I "
1	I	II Eclampsia
2	II	III "
1	III	II "
1	I	-- " Husband's gr. IV.
1	II	-- Pernicious vomit. Husband's gr. III.

Many hypotheses have been advanced to explain the etiology of eclampsia. However, they do not attempt to coordinate the cause with the symptoms of the disease. To be accepted, any hypothesis must explain the associated symptoms of albuminuria, edema, headaches, rising blood pressure, convulsions, increased viscosity of blood, coagulation thrombi in the capillaries, and the focal necroses of liver, kidneys, and the brain, as well as the occurrence of antepartum, intrapartum and postpartum eclampsia.

In the few cases of eclampsia under consideration, the mother's serum agglutinated her baby's red cells *in vitro*.

It is presumed that the waste products of the fetal metabolism pass into the mother's system for disposition. It is also presumed that the fetal agglutinogens will be agglutinated *in vivo* of the mother's system as it would occur if transfusion would have been done of incompatible blood, or as it occurs in the test tube. These two presumptions together with the clinical signs of eclampsia aid materially to explain the symptoms of the disease.

The noticeable signs and symptoms of an eclamptic attack appear towards the later stages of pregnancy, i.e., at the time of the most rapid growth of the fetus. The increased anabolic process goes hand in hand with increased rate of catabolism. Increased amount of waste

products, including the waste products of the blood system, are thrown or diffused into the mother's system. Whether the specific agglutinating substance is passed to the mother's system in the waste products as an albumin molecule or as a hypothetical "agglutinogen," is not known. In the fetal body it is associated with the red cells. When in the mother's blood stream, it is agglutinated and suspended as fine colloidal particles. A new colloidal state of the blood is produced which probably accounts for the more viscous, "thicker," blood of the eclamptics. This new state of the blood is the paramount factor of the disease. The physical and chemical processes which associate with a colloidal substance in the blood stream may readily explain the signs and symptoms of eclampsia.

The mechanism of the heart has to speed up to pump the thicker, colloidal blood. Further, the osmotic pressure is increased in the blood vessels as colloids have great power to adsorb water. This results in increased blood volume as well as blood pressure. These effects of colloids in the blood stream have been amply demonstrated by Baylis,[8] Erlanger and White[9] and Kruse,[10] while working with colloids, as acacia, gelatin, etc.

The more water bound up and kept in the blood stream, the less there is eliminated through the kidneys, though the blood pressure may be high.[11] The other symptoms of eclampsia, as headaches, edema, and the muscle phenomena, are the direct result of the eclamptic syndrome of the increased viscosity of the blood, the high blood pressure, and the increased blood volume. These factors produce edema as a result of congestion and stasis in all organs of the body, including the brain; and when, according to Erwin,[12] the intracranial pressure approaches that of the blood stream, the convulsions with the eye symptoms appear.

This condition is further complicated by the reduction of the alkali reserve of the blood plasma due to the pregnancy itself, but more exaggerated during the eclamptic period, as shown by White,[13] and Killian and Sherwin.[14] The decreased alkali reserve of the blood is followed by reduced oxygen-carrying capacity of the latter. The lack of oxygen not only embarrasses the central nervous system, but materially slows up body function in general and probably aids in the formation of agglutination thrombi, as the increasing acidosis assists flocculation of the colloidal substances.

It is probable that the agglutination thrombi in the capillaries of the liver lobules, kidneys, brain, and elsewhere, have similar origin as we see in the isoagglutination tests. The floccules at first are small, but when forced together by slight shaking, they form large clumps. In the blood stream they are probably just large enough to plug the small capillaries of the liver, kidneys, and brain.[15] The stoppage of

the capillaries not only produces the focal necrosis of the particular organ involved, but aids in the stasis, congestion, edema, retention, increase of blood pressure, and convulsions,—the vicious cycle of eclampsia.

SUMMARY

The hereditary *anlage* determines the blood group of the offspring. This same *anlage* determines whether the mother's blood agglutinates the fetal or not.

In this preliminary work on eclampsia it has been found that the mother's serum agglutinates her baby's red cells *in vitro*. It is presumed that such agglutination may occur *in vivo* of the mother's blood stream resulting in a "thick," viscous blood.

The symptoms and pathology of eclampsia may readily be explained on the basis of the "thick," viscous colloidal state of the blood.

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THE MANAGEMENT OF THE THIRD STAGE OF LABOR

By Charles A. Gordon, M.D., F.A.C.S., Brooklyn, N. Y.

THE problem of the management of the third stage of labor has by no means been solved. A careful survey of present-day knowledge shows that not even in the fundamental principle of care is there unanimity of opinion.

To the average person treatment of the placental stage seems simple, for delivery is complete with the birth of the child. The placenta is literally the afterbirth. The treatment may be anything from immediate Credé to hasty manual removal, yet De Lee tells us that more women die from accidents of the third stage of labor than during the other two stages combined. The easy problem evidently has a different solution.

We believe that interference with the normal mechanism of separation, whatever that may be, is the commonest cause of retained placentas, postpartum hemorrhage, and infections.

Some of the great teaching clinics fail to impress students with the

importance of the expectant treatment of the third stage of labor. Much time may be spent upon the mechanism of separation, and little time upon the recognition of the clinical phenomena accompanying separation. Modern textbooks, too, with but one or two exceptions, are not precise or clear in their discussion of treatment. The tendency has been to fix arbitrary time limits upon this stage, without making provision for the cases which fail to come within the limit. A loose terminology is largely responsible for misunderstanding. Above all, for some unknown reason, the method of Credé is more deeply impressed upon our minds than any other operative procedure in obstetrics; it is apt to be the first postpartum thought.

Credé,[1] absolutely ignoring the fundamental necessity of separation before expulsion, pressed out the placenta in his first 2,000 cases with the second or third contraction in an average time of four and a half minutes. He had retention of the entire chorion in 18 cases, and partial retention of the chorion in 78 cases. Later he changed his technic so that expression was not done until fifteen minutes had elapsed.

A great many explanations as to the exact mechanism of the separation and expulsion of the placenta have been offered. These have been largely theoretical, some depending upon frozen section work, others upon cesarean section or examinations made during operative deliveries. Practically all agree that the placenta is expressed according to the mechanism of Schultze or that of Duncan. Briefly, the Schultze mechanism (1865) requires the formation of a retroplacental clot with escape of the placenta, fetal surface first, through the membranes. Matthews Duncan, in 1871, asserted that the placenta first separated at the edge, without retroplacental clot, and escaped edgeways, maternal surface first.

The mechanism is of more than academic interest, for its application is of vital importance in the management of the third stage of labor. Freeland, in a study of 2,600 cases at the Rotunda Hospital, noted Schultze mechanism in 2,145 and Duncan in 465 cases. In the 2,145 Schultze cases the membranes were incomplete in only 108, or 5 per cent; whereas, in the 465 cases of Duncan mechanism the membranes were incomplete in 70, or 15 per cent. There were in this series 28 cases of antepartum hemorrhage, in every one of which the mechanism was Duncan. He concluded, therefore, that the mechanism described by Duncan was almost pathologic, the separation at the edge actually occurring in antepartum hemorrhage or being artificially caused by massage of the uterus. Polak, in 2,000 cases, arrived at similar conclusions.

The general impression is that delivery of the placenta is commonly effected by Schultze's mechanism, yet we will all agree that abdom-

inal massage is the commonest method of management of this stage of labor. Either, then, massage does not influence the mechanism, or if it does, Schultze's method is pathologic.

For practical purposes, is it not a fact that separation is due to a contraction in the placental site, in which the whole uterus does not share? Perhaps the details of the mechanism vary with the location of the placenta, its size and shape, and the size of the uterus.

This controversy has, at different times, enlisted many obstetricians. It seems to me that the work done in 1918 by Weibel[2] in Wertheim's Clinic is epoch-making in character. Forty-six women were delivered on an x-ray table with lateral and dorsal plates in position. As soon as the child was born, the cord was quickly cut and the maternal end injected with 60-80 c.c. of Lilienfeld's *Kontrastin,* a quantity which he found sufficient to fill the placental veins without escaping, as it does in the so-called turgidization of the placenta. Serial pictures were taken with astonishing results. Often, a picture taken one minute after delivery would find the placenta already separated. In 21 cases he was able to follow the placenta from separation to expulsion. In these cases separation began at different points or all at once over the whole placenta. In 19 of the 21 cases the placenta passed through the contraction ring end first, as Duncan described. There was commonly a delay in the separation of the membranes, whatever blood there was serving to separate them, and not the placenta. Passage of the detached placenta through the external os, vagina and introitus depends upon the length and adherence of the membranes and the size of the birth canal and the usual deflection of a passenger. It is true that Weibel's series is small in number, but the uniformity of his results, and the exactness of his method of research make it highly probable that we must radically reverse our views on this subject. Warnekros, in Bumm's Clinic, has been conducting a similar study.

We have reviewed the third stage in 1,600 cases of labor occurring under our supervision in St. Catherine's Hospital.

As soon as the babe is born, a tell-tale tape tie is loosely placed upon the cord, at the vulva. The fetal end of the cord is not clamped, but is closely tied when pulsation stops.

The abdominal coverings are then removed and the patient is carefully scrutinized for the practical picture of separation. In the abdomen, after a physiologic period of inertia, the uterus rises above the umbilicus, not relaxed or soft, but firm in the upper segment. The lower uterine segment may be distended over the pubes, although this sign is not constant. A detached placenta half way through the upper segment into the lower, or protruding through the lower uterine seg-

ment into the vagina, may not distend the uterus. Descent or advance of the cord with its tape tie from 10 to 15 cm. is constant.

Together with these two signs the patient is instructed to bear down. If she has a diastasis of the recti muscles, these muscles are firmly held together after the method of Baer, and she is again asked to bear down. If this is not effectual, one hand on the fundus of the uterus, not squeezing, but pushing the uterus straight down the vaginal axis, expresses the placenta by the piston method. If all these methods fail, we catheterize the bladder, if need be, and with the uterus firmly contracted, try Credé, using anesthesia if necessary.

The membranes are treated expectantly without torsion. The time for separation is as important as that for the placenta itself. Traction may be done only after partial descent of the membranes.

If the placenta is still retained, or if it has not yet separated, the cord is cut just within the vulva, leaving the tell-tale tie in its place. Pituitrin is not given. The patient may then expel the placenta herself, or subsequent Credé may express it. Nothing further is done unless hemorrhage occurs, when Credé, under anesthesia, is done or, failing in that, the placenta is manually removed.

There are, of course, exceptions to this rule, but it is obviously no more possible to conduct the third stage of labor by rule than it is to conduct the first stage.

If, upon our routine inspection of the placenta, large pieces were missing, I believe we would remove them manually. So far, we have not had to do this: membranes or small pieces of placenta are left for spontaneous expulsion.

In this series of 1,600 cases pieces of membrane have been retained four times, without any disturbance other than the pain incidental to their expulsion in a clot. There were nine cases of twin pregnancy with one placenta, five with two placentas, in none of which was there placental retention or postpartum hemorrhage.

We have met with four cases of placenta succenturiata, in all of which the accessory placenta came with the membranes and was not retained. A piece of placenta about 6 by 8 cm. remained in the uterus for four days, following manual removal during cesarean section for placenta previa. Even with pain and sharp hemorrhage on the second day, its presence was unsuspected. It was easily expelled on the fourth day with some further loss of blood and no rise of temperature.

The entire placenta was retained for more than two hours in ten cases. In two cases it was retained for three hours, two cases for fourteen hours, and two cases for twenty-nine hours. There was at no time more than the usual bleeding. In every one of these cases the placenta was thought to be separated and was fully expressed

by Credé without anesthesia. In the seventh case, in which the placenta was retained for ninety-six hours, Credé was successful, but not until considerable blood had been lost. There were two cases of manual removal of the placenta. In one, a case of hydrocephalus with craniotomy, the placenta was retained for sixty-six hours, when hemorrhage occurred. The placenta was found to be partially separated and was easily removed. This patient's convalescence was stormy, complicated by pyometra and persistent subinvolution. In the ninth case the placenta was retained for twelve hours when alarming hemorrhage occurred. Transfusion was done and the placenta removed piecemeal with some difficulty. The postpartum course was normal, without temperature. We believe that this placenta must have been separated at some point, for Ahlfeld has pointed out that a completely-attached placenta cannot bleed. However, no point of detachment was found, and we consider this a true adherent placenta. In our last case, a primipara, after normal delivery, the placenta was retained for twelve hours, when death took place suddenly. There had been no hemorrhage and less than average blood loss. At autopsy it was thought that death occurred from acute dilatation of the heart. A small calcareous placenta could not be separated from the uterine wall. The pathologist reported placenta accreta. We feel sure that in this case death was not due to retention of the placenta.

In this series there were fourteen cesarean sections, one of which was done for abruptio placentae, and another for placenta previa. In placenta previa treated by the vaginal route, failure to express should be followed by manual removal.

In conclusion, we believe:

1. The recognition of separation is of great importance. 2. The frequent occurrence of speedy separation is responsible for the success of Credé. 3. Indiscriminate use of Credé will surely cause the very end-results which that operation is designed to avoid. 4. Students should be taught that Credé is for the pathologic third stage. 5. Retention often occurs in the lower birth canal, due to the recumbent posture of the patient and inability to use her abdominal muscles which are then chiefly concerned in expulsion. We see no reason why the primitive sitting posture could not be revived for delayed placentas. 6. The placenta may safely be retained for many hours. 7. The adherent placenta is rare: it causes no bleeding until partial separation occurs. 8. The completely separated placenta causes no bleeding. 9. The partially separated placenta always causes bleeding. This is the placenta which calls for manual removal. 10. Manual removal carries a high mortality, but it has a distinct indication—hemorrhage. Delays are dangerous after hemorrhage occurs.

Detailed studies of the management of the third stage of labor are not easily found in the literature. From our point of view, we found nothing so practical or precise as Polak's study in 1915.[3] We hope that the work and deductions of Weibel will stimulate interest in the placental stage of labor, so that its management may be more clearly defined for us all.

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256 JEFFERSON AVENUE.

THE PATENCY OF THE FALLOPIAN TUBES ASCERTAINED BY TRANSUTERINE INJECTION OF FLUIDS*

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SINCE the introduction of air or gas into the peritoneal cavity by way of the fallopian tubes has become a popular method, following the suggestion and practice of Rubin of New York City, it may be of interest to know that tubal irrigation through the uterus has been practiced by the writer and some of his colleagues and assistants since its first use in 1896. The only allusion to the method which has been published by the writer may be found in the Transactions of the American Gynecological Society for 1909 in a discussion of papers by Dr. Boldt and Prof. Hoffmeier on "Conservation of the Pelvic Organs."

The method was first tried during an operation upon a young woman with acute salpingitis and appendicitis with extensive pelvic peritonitis. We were impelled to pursue a conservative course in this instance because the patient was expecting marriage in the near future. At that time it was considered folly to leave a tube which was "dripping with pus," yet we allowed the left tube and corresponding ovary to remain *in situ*, although the specific nature of the infection was beyond question (the responsible party confessed it). After opening the abdomen and removing the right tube and ovary with the appendix, all of which were hopelessly destroyed, we proceeded with the injection. The cervix uteri was caught with a tenaculum forceps, a large glass syringe filled with hot mercuric bichloride 1-1000 was introduced into it and passed through the internal os. Firm pressure with the hand caused a small stream of the solution to appear at the pavilion which was caught upon a sponge and not allowed to flow

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into the abdomen. Besides the transuterine irrigation of the left tube the same solution was used to irrigate its distal end by distention and flushing until we reached every possible fold in its mucosa. After a stormy first night the patient recovered, was married and bore her first child nine years afterward and a second child two years after that. The lady and her two daughters are now living and in excellent health.

Since then tubal injections have been practiced at Columbia Hospital in this city, especially since iodine has come into general use as a sterilizing agent.* In some instances the injection has been made just before opening the abdomen in an effort to secure a better technic, but as a rule the incision is made first. Inhibiting solutions have as a rule been used and we are not informed if the full strength tincture of iodine has been used in any case. We are not aware of any complication as a result of this procedure nor have patients suffered additional pain. There is always a rise of temperature after "pus operations" and we cannot decide that it is ever caused by these injections. We have not heard of a single instance of accident or even anxiety due to these injections since iodine has been used.

In a few instances we have tested the patency of the tubes in cases of sterility. In our last case the patient had been married for six years without conceiving. During the greater part of this time she had an uncontrollable leucorrhea. When she came under my care the discharge persisted after resorting to the customary treatment, including curettement. The husband was found competent in every particular and in absolutely perfect health. The use of bismuth injections appeared to benefit the patient but we determined to investigate the condition of the tubes as the patient was very anxious to have a child and willingly consented to have her abdomen opened. It is possible that the isthmus was the seat of the obstruction or infection in this case for the patient conceived three months after leaving the hospital and her child is now two years old. In some instances we have failed to succeed in passing some obstruction in the tube, the force being hand pressure as mentioned above. The cornua and the narrow portion of the tube including the isthmus have hitherto been considered beyond reach of our usual methods. Is it not a fair supposition that some method of reaching this area would enable us to deal with the infection or obstruction which has left a patient hopelessly sterile? Attempts at reaching the remote cornua and isthmus by curette or probe have failed, while it remains to be determined if distention of the tubes with gas will prove to be successful in relieving sterility.

*It is quite possible that tubal injections *given without opening the abdomen* may return to professional favor, if so let no one think himself a pioneer who tries it, for the literature of German medicine contains a report of an operation of this kind written half a century ago.

There is no ground whatever for fear of forcing infectious tubal contents into the peritoneal cavity when fluids are used as described above. In any case with pus in the tubes the peritoneum is either infected or shut off by protective adhesions, while by our method the tubes are held in view upon a sponge outside of the cavity before the irrigation begins.

A word of comparison between the efficacy of the two tests for patency remains to be said. The visible evidence of patency determined in appropriate cases with the abdomen open is gratifying and definite. To this it is quite possible that a measure of, or even complete sterilization of the mucosa of the isthmus has been added, while with gas we could not hope for such a result. Again we know that the introduction of gas into the cavity will only prove one tube to be open and we still would be uninformed as to the condition of the fimbria which may be sufficiently open for the passage of gas under pressure and yet be incapable of performing their function. We are confident, however, that the proof of the actual presence of tubal obstruction by the recent use of air or gas will prove an illuminating aid to the study of sterility, a subject which has hitherto not received the attention to which it is entitled as we can observe very little if any better results by modern treatment than by former antiquated methods.

STONELEIGH COURT.

PHENOLBARBITAL SODIUM (LUMINOL SODIUM) TREATMENT FOR HYPEREMESIS GRAVIDARUM*

BY RALPH LUIKART, M.D., F.A.C.S., OMAHA, NEBR.

THE successful treatment of hyperemesis gravidarum with phenolbarbital sodium seems worthy of record because of the hitherto unsatisfactory therapy of this condition and because of the important bearing of severe vomiting in pregnancy upon fetal and maternal life. These observations presage a wide field of therapy for this drug in emesis from various causes. Under hyperemesis gravidarum are included those cases of persistent vomiting which have no definite pathology and for which no cause for the vomiting other than the pregnancy can be found.

Recent studies suggest that the underlying factors of hyperemesis and its complications are to be sought in some toxemia, depending on disturbed hepatic function. The weight of evidence favors the view that the liver when underfed,—i.e., when its glycogen content has

*Read before the Douglas County Medical Society, Omaha, October 10, 1922.

become low as occurs in mild vomiting,—is a poor detoxifier and thus a vicious circle becomes established. Therefore, it would seem reasonable to assume that if the patient could be made to retain and assimilate food, the chain of events which frequently develops into hyperemesis gravidarum could be avoided.

It has long been known that patients suffering from this malady retain and assimilate food given shortly after a hypodermic of morphine, codein or heroin, and that a few such feedings thus obtained sometimes save the life of the patient; but because of deleterious after-effects the number of cases in which these narcotics can be used is decidedly limited.

The intravenous use of glucose seems a more rational procedure. It has been used with excellent temporary results and occasionally with permanent cure. However, in those cases where vomiting is protracted it is not feasible to keep up the patient's nutrition by intravenous glucose feeding. Furthermore, the reactions are often severe.

C. E. Paddock* has recently advocated feeding by the duodenal tube, which in his hands has given satisfactory results. While not controverting his conclusions I should feel that this method, because of its unpleasantness to the patient, because of the difficulty of its application in those suffering from extreme nausea and because of the rather frequent difficulty of introducing the tube, renders this means of giving nourishment one of last resort, rather than one of election. The present vogue in the use of the duodenal tube for biliary drainage has emphasized the difficulties which may be anticipated. In skilled hands the passage of the tube in patients not suffering from nausea is only sixty to eighty per cent at the first trial.

It would seem that a drug which would allay vomiting and nausea long enough for food to be taken and assimilated and yet have no markedly deleterious effects would be ideal. Phenolbarbital sodium in our hands has been such a drug. The use of phenolbarbital sodium is not an immediate cure for hyperemesis gravidarum, but a relief to such an extent that the patient can often be carried to the end of the third month of pregnancy with her weight and general strength but little impaired. Thus the desired end is gained in that we have a woman in practically normal health and a live fetus in utero at the end of the period of intoxication.

The method is as follows: Phenolbarbital sodium, gr. 1 to 2, is administered hypodermically, the pure or powdered form only should be used, as the milk sugar in the tablet triturates will often cause abscesses. Administration every four hours will suffice in the majority of cases, though it may be given at shorter intervals for three or four

*Surg., Gyn. and Obst., 1922, v.

times if relief is not prompt. If the case is seen early, regular feedings are continued—six a day. Great care must be taken with the general management. There should be examinations of urine, a record of total intake and output of fluids, blood pressure determinations daily, pulse, temperature and respiration records.

If the patient is starved and there has been considerable loss of weight and strength, then feeding should be along the following lines: Eskay's food, invalid formula, two ounces every hour; carbonated water, or tap water, if preferred, midway between feedings. The bowels should be evacuated by cathartics, calomel and a saline, such as Karlsbad, sodium phosphate, etc., preferably, and should be made to move daily, if necessary with help of enemata. Fluids are given, Fischer's solution, saline, per rectum, as needed to supply water and alkali reserve. Visitors are not allowed and the room is darkened. When the patient asks for food frequent feedings in small quantities are given. The amount and kind of food is determined by the manner in which it is retained. Eventually regular meals are given, when a hypodermic dose of phenolbarbital sodium should be administered fifteen to twenty minutes before the meal. As food and water are taken and retained the mental and physical condition improves rapidly. If the case is obstinate, treatment may need to be continued until the end of the third month of pregnancy.

The sensation caused by phenolbarbital sodium is described by patients as a "fluid feeling" of the entire body.

Occasionally the patient becomes a day sleeper and complains of wakeful nights. A hypodermic of seven grains of caffein sodium benzoate administered with the phenolbarbital sodium helps to overcome this, and does not interfere with the quieting effect on the nausea of the phenolbarbital sodium. A cup of coffee serves the purpose somewhat less satisfactorily. The only untoward effect of phenolbarbital sodium observed has been urticaria. This is relieved to a large degree by sponge baths of 1 per cent lysol solution, as needed.

CASE I.—Mrs. H., twenty-seven, para ii. The family history was negative, except all were highly nervous. She was anxious to have a child, the child of the first pregnancy having died of diphtheria when fifteen months of age.

During the first pregnancy, which was three years ago, vomiting was severe to the end of the third month, and this confined the patient to bed most of the time. The delivery was normal. One year later the appendix and tonsils were removed.

The patient became pregnant while on a trip to Cuba and at once began vomiting in the morning. She was then about fifteen days past her first missed period. The vomiting grew constantly more severe, and she became bedfast.

On examination the blood Wassermann and spinal fluid were negative; blood sugar 0.08 per cent. Uterus in good position, cervix not eroded. Teeth excellent.

Treatment.—The patient was kept in bed on dry diet, given in small quantities at frequent intervals; fluid was given only by rectum. Bromide and chloral in large doses were administered by rectum. Under this treatment for a period of ten days

the patient grew gradually weaker and her vomiting increased in severity. She was then taken to a hospital and treatment continued along the same lines. In addition to the dry diet she was allowed ginger ale, thirty minutes after feedings, for which much has been claimed by some obstetricians. In addition to the chloral and sodium bromide, she received corpus luteum intravenously (Armour's), beginning with 1 c.c. a day, and after two days increasing to 2 c.c. for a second period of two days, and subsequently to 3 c.c. per day. As no relief was obtained cocain was given by mouth and also bismuth subcarbonate and cerium oxalate. Later adrenalin and placentin were tried by mouth. The patient became progressively worse, until she retained no fluid by either mouth or rectum. On the eighteenth day of treatment she vomited clear fluid and bile continuously for a period of five hours, and again the next day. Her bowels were kept open with difficulty. Her blood pressure fell to 90, pulse 98; the urine contained acetone 1 +, was slightly acid, of a specific gravity of 1030, with a trace of sugar; no diacetic acid was present.

In this serious condition gastric lavage was given and 500 c.c. of sodium bicarbonate solution was left in the stomach. A measure of relief was gained, but vomiting soon recurred. An intravenous administration of 900 c.c. of 10 per cent glucose was given slowly during a period of two hours. Care was taken to maintain the solution at body temperature. It was hoped that by following minutely Woodyatt's directions the reaction might be minimized. In this we were not disappointed, but our glucose unfortunately was largely and promptly eliminated by the kidneys, notwithstanding the fact that we had taken pains to give less than 0.8 gm. per kilo of body weight per hour. However, the immediate effect of the glucose treatment was favorable. The blood pressure rose to 110; indeed, the improvement so impressed the patient's friends that they insisted, against advice, upon removing her from the hospital. This proved unfortunate, for though her home was comfortable and she had a private nurse, she failed to maintain her improvement and vomiting grew gradually worse. Corpus luteum, which had been discontinued, was resumed, but seemed to increase her vomiting. Thyroid extract, gr. i, t. i. d., gave temporary relief, but failed after a few days' trial. Her pulse reached 100, temperature 99°; the urine, of a specific gravity of 1030, contained acetone and sugar; the ammonia co-efficient was normal. There were no signs of nephritis at any time. The patient became slightly jaundiced; she retained nothing by mouth or rectum, and the loss of body fluids became so extreme that she appeared actually desiccated. Recourse was again had to glucose, all of which was found by quantitative analysis to be eliminated in the urine within thirty-six hours. The patient was returned to the hospital. A consultant suggested cauterization of the cervix and for psychic effect his advice was followed. The patient became progressively worse, weak, restless and sleepless, and gave up hope of being able to go on with the pregnancy. At this juncture Dr. Ernest Kelly suggested phenolbarbital sodium to relieve her mental distress and sleeplessness. The results were striking. Phenolbarbital sodium brought forth immediate results, for the patient promptly and steadily improved, and her depression ceased. It was at this point that I made the observation that *after each dose of phenolbarbital sodium the patient's vomiting ceased for from two to three hours.* Liquids began to be retained and even solid food could be administered in small amounts at frequent intervals. Within three or four days the patient asked for a full tray, began to eat regular meals, and improved rapidly. An early attempt was made to omit the phenolbarbital sodium, but she promptly vomited the food ingested, and therefore the phenolbarbital sodium was resumed. Later the dosage was reduced with no recurrence of vomiting. Her nutrition improved rapidly and finally the phenolbarbital sodium was reduced to a bedtime dose. This proved necessary to prevent early morning vomiting for a time. An occasional tablet by mouth, of 1½ grains, was found necessary to re-

lieve early morning vomiting even after the third month. At the time the phenolbarbital sodium treatment was instituted, her weight was 82 pounds. Her normal weight was 98 to 103 pounds. After twenty days' treatment her weight was 93 pounds. The patient recently went through with normal labor and had a healthy child.

CASE II.—Mrs. D., age twenty-three, para 1.

The physical examination and Wassermann were negative. She complained of nausea and constipation. Corpus luteum was given a fair trial, with no results except urticaria. Cocaine, bismuth, calomel and saline with bromide, gr. 90 and chloral, gr. 40, per rectum each day, etc., were given, without effect. (At this juncture my experience with phenolbarbital in Case I occurred.) As soon as the phenolbarbital sodium treatment was begun the nausea and vomiting ceased, the intake of food and water increased, and the patient held her weight. The patient's condition was practically normal at the beginning of the fourth month, except for an occasional morning nausea. Caffein sodio-benzoate was used successfully to prevent day sleeping.

Hypodermic injections of phenolbarbital sodium have been given to some twenty patients with vomiting from various causes, some with prolonged vomiting following anesthesia, with immediate cessation.

SUMMARY

1. Phenolbarbital sodium allays nausea and vomiting, and permits the ingestion and the assimilation of food under conditions of pernicious vomiting.

2. Hypodermic administration is necessary for satisfactory results.

3. Phenolbarbital sodium has proved successful in hyperemesis gravidarum when intravenous corpus luteum, intravenous glucose, and duodenal feeding have failed.

4. The dosage of the phenolbarbital sodium may be diminished, or even suspended, as nutrition and water balance become normal.

5. During the three months of hyperemesis gravidarum treatment may be continued with varying dosage of phenolbarbital sodium without ill effect.

6. The measures hitherto employed for hyperemesis gravidarum, such as intravenous glucose and duodenal feeding, are susceptible of only temporary exhibition.

CONCLUSION

Phenolbarbital sodium has proved, in our limited experience, to be the best sedative yet advanced to control hyperemesis gravidarum.

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OBSTETRICO-GYNECOLOGICAL DIAGNOSIS. THREE UNUSUAL CASES*

By Adam P. Leighton, Jr., M.D., Portland, Maine

Case 1.—*Hematosalpinx.* Miss K. L., a trained nurse and hospital executive, age twenty-five years. Past history, children's diseases only and in good health up to 1915, when appendectomy was done for acute appendicitis. This was evidently considered a "clean" case for the incision was tightly closed. On the tenth day after operation, a large quantity of pus was discharged through the wound. This so-called "stitch abscess" drained profusely for two to three weeks. Recovery was slow and it was a year before the patient could resume her hospital work. In 1918, she was operated upon again, following symptoms of continuous abdominal pain, with rapid loss of weight. "Adhesions were broken up" according to her statement and the left tube was removed. Good recovery followed with health and weight quickly regained.

On June 12 of this year, she suffered an acute attack of pain in the right adnexal region. No temperature or vomiting. She was confined to her bed for several days, but recovered quickly and resumed her hospital duty. On July 12, just before starting from her home in Worcester, Mass., to spend her vacation at Old Orchard Beach, Maine, she had another attack of pain in the lower right quadrant, much more severe than previous attacks. There was vomiting and extreme distention, but no rise of temperature. Diagnosis was made of intestinal obstruction. By enemata, however, the distention was relieved. Ten days later, having seemingly recovered to such a degree as to allow her to travel, she came to Old Orchard. The next day, July 23, I was called from Portland to see her. The history was given me just as I have related. Her menstruation had been regular and normal. When I saw her, she was suffering acute pain and was extremely sensitive over McBurney's point. There was pallor, abdominal distention and her temperature was 101°, the pulse 110 and respiration 42. I had her immediately removed to my hospital. The white count was 15,000, hemoglobin 50 per cent, urine negative and lungs negative. Blood pressure was 118/74. It certainly had the ear marks of an "acute abdomen" but I decided to temporize. Hot fomentations and enemata with salines gave relief and excellent results, with relief of distention. She was decidedly improved. The next day, July 25, she was comfortable up to the late afternoon, when there was a sudden return of pain, followed by collapse. Temperature 103°, pulse 132 and respiration 44. Laparotomy, with gas-oxygen anesthesia was immediately performed through a median incision. The abdomen was filled with fresh blood and blood clots. I did not think she would live to be taken from the table. The network of adhesions made it extremely difficult to reach the pelvic cavity. The right tube and ovary were removed. Two cigarette drains left. Macroscopic examination of tube showed marked distention due to a large organized blood clot. There was no tubal rupture. The abdominal end of tube was open, with partial extrusion of the blood clot simulating tubal abortion. In the center of the clot was a small amount of foul-smelling pus. Microscopical examination showed an old chronic salpingitis but no sign of decidua or decidual reaction. It was a typical hematosalpinx. There

*Read at the Thirty-fifth Annual Meeting of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, Albany, N. Y., September 19-21, 1922.

was a copious discharge of pus for three weeks, the wound healing well and the patient making a good recovery.

Here was a case wherein the appendix had been removed and later a secondary operation was done on account of adhesions which evidently caused obstructive symptoms. I had never seen the girl before and the picture when I first saw her, was anything but one of possible ectopic pregnancy. She was septic. She had an increased white count. Her pain was exquisite over the old appendiceal scar. One would recognize obvious localized peritonitis and possibly consider stercoral ulceration with perforation, ovarian cyst with twisted pedicle and almost anything except to connect her symptoms with any adnexal difficulty. When she went into collapse and showed the extreme pallor and had prostrating pain, I confess I did consider ectopic rupture. All this, however, was with a history of regular menstruation. When the abdomen was opened and the hemorrhage found, the picture was complete. The microscope disclosed a hematosalpinx. I have often seen some free blood in the peritoneal cavity when operating for the removal of an unruptured pregnant tube and of course, when an ovum is near the fimbriated end and the tube is in the way of aborting it into the pelvic cavity, there may be a considerable amount of intrapelvic bleeding and the case simulate tubal rupture. My explanation is, that even at the first attack of pain on June 12, there was considerable hemorrhage from some eroded vessel in or near the fimbriated end of the tube. A primary hematocele was formed. A month later, a fresh hemorrhage took place pushing the blood tumor further up into the abdomen and then came the last and most severe attack of pain, with collapse and exsanguination, due to the same reason, complicated with coincident pelvic and abdominal infection from the pus collection in the tube.

CASE No. 2.—*Dermoid cyst simulating pregnancy.* Miss F. B. Age nineteen. Patient presented herself at my office on May 10, of this year. Said she had a "swelling" in her abdomen. Past history: Had influenza in October 1921, followed by empyema with subsequent rib resection. Made a slow recovery. Menstrual history: Onset at thirteen years of age, three to four-day type and rather irregular. Menstruated in October and November. Up to the time of consultation, she had menstruated but once since November, although there was a slight flow in early April. External examination disclosed a symmetrical abdominal tumor, corresponding in size and height to a twenty-eight weeks' pregnancy, rising to about three fingers' breadth above the umbilicus, which had been of slow regular growth, obvious to the patient since February. Attempt at vaginal examination showed an unruptured hymen with digital insertion impossible. There was a well-marked pigmentation of the primary areola and Montgomery's tubercles were present. Colostrum in good amount was easily expressed from both nipples. She said that she had been nauseated most of the time the past six months. Fetal heart was not present. The mass was tense to the touch and resembled hydramnios. She stated that the mass was "sore" and she was "lame" across the abdomen. Her temperature was 101°. She emphatically denied any attempts at sexual intercourse. The picture was one of undoubted pregnancy, however, and I sent her home to her family physician with a diagnosis of intrauterine death of fetus. The growth had been too slow for hydatidiform mole and there was no suggestive vaginal discharge. The physician telephoned me, the next day from a nearby town where the patient lived and confirmed the diagnosis and even assured me that he and the girl's father knew the fellow who was responsible. Her father had been "suspicious" of his actions for some time. A thrashing was administered to the boy by the irate parent. A day or so later, the doctor and the father of the girl arrived at my office, bringing the girl with them, and desired that I make some arrangements

for her care at time of confinement. I took her to the hospital for observation with the expectation that labor would soon take place or that the uterus would have to be emptied. Her temperature ranged between 100.6 and 102. The pain increased in severity. Blood count showed 24,000 white cells on May 21, and on May 25, the count was 31,000. Upon questioning the girl, she confessed to attempts at sexual intercourse and stated that there had been seminal deposition upon the external genitalia. I gave her an anesthetic, ruptured the hymen and made a vaginal examination. The cervix was elongated, conical and normal to the touch and far from the feel of the cervix of pregnancy. I began to waver in my diagnosis. The pelvic brim was well filled with a mass similar to the engagement of the lower uterine segment. No body of a nonpregnant uterus could be felt. The next day, I opened her abdomen with the idea of exploration to ascertain the cause of the intense localized pain in the left lower quadrant. I found a large dermoid cyst of the left ovary. It was everywhere adherent to peritoneal surfaces and the omentum. Incision was made into the tumor and about six quarts of fluid resembling pea soup was drained off. There were two large wads of hair as large as one's two fists and hundreds of little balls of sebaceous material, slightly larger than peas. The tumor was peeled off and removed. Drainage was left for three weeks and she made a good recovery. I have prided myself that I could diagnose pregnancy and have laughed at the mistakes of my colleagues, when in the last half of pregnancy, the diagnosis has been one of tumor. I have also seen infinitely better men than I, open the abdomen on a pregnant uterus when they contemplated removal of an abdominal neoplasm. Here was a girl whose menstrual history, plus the possible opportunity for pregnancy being present, had in addition, deep pigmentation of the areola and a considerable quantity of colostrum in the breast. It looked to me like fetal death in the uterus coupled with a sapremia. I have never seen colostrum present in such an amount, in a case of abdominal or pelvic tumor, unless perhaps the patient had previously borne children.

The inflammatory condition of the dermoid is interesting too, in addition to the complete adhesion of the mass to the abdominal contents. The size of the dermoid is worthy of especial notice.

CASE No. 3.—*Eclampsia without usual preeclamptic symptoms.* Mrs. J. C., age 31, primipara. Patient was under my constant observation from beginning of third month of pregnancy. Past history negative except for scarlet fever, at fourteen. Urinary examination was regularly made at two and one-half week intervals. The probable date of confinement was the last week in July of this year. On June 13 I went to her home to make the customary pelvic measurements. Except for an edema of the ankles there were no objective or subjective symptoms worthy of note. Her blood pressure was 118-80. There were no visual disturbances, no headache, epigastric pain or dizziness. The urinary specimen was examined this day and was absolutely normal. Two days later, on June 15, I was called to her home. Edema was not particularly increased but she had a slight headache. Her mental condition was peculiar for she acted silly. Amnesic aphasia was present and rather extreme. Blood pressure 120-80. In the evening I returned to her home taking a nurse with me to watch her and care for her. As I entered the house, I heard a commotion upstairs and the unmistakable respiratory sounds of an eclamptic fit. I found the patient in a severe eclamptic seizure. Administering a half grain of morphine, I called an ambulance and had her taken to my hospital where I immediately performed cesarean section. Her blood pressure just previous to section was 100 systolic and 70 diastolic and catheter specimen of urine showed a heavy trace of albumin. A healthy child was

delivered and the patient made an uneventful recovery. The urine was clear and normal in every respect on the third day and she voided large quantities. The antepartum convulsion was the only one she had. Her mental confusion quickly cleared. She was home on the eighteenth day.

The absence of visual symptoms, the absence of the omnipresent preeclamptic symptom of epigastric pain, the low blood pressure and normal urinary findings, followed by true eclampsia in less than forty hours is rather extraordinary.

I cannot account for the low blood pressure after the eclamptic onset and just previous to the cesarean unless maybe an old myocardial condition was present and the heart muscle overtaxed by the convulsive effort, would be a sufficient explanation.

192 STATE STREET. (*For discussion, see p.* 434.)

AN OPERATION FOR RETRODISPLACEMENTS OF THE UTERUS*

BY JOHN W. KEEFE, M.D., F.A.C.S., PROVIDENCE, R. I.

I HAD the privilege last spring of witnessing a number of operations performed by Italian surgeons, both at Naples and at Rome, and I was greatly impressed with the dexterity and other accomplishments and the excellent technic which they practiced.

An operation performed by Professor Pestalozzi of Rome appealed to me as something out of the ordinary, and I thought you might be interested to know more about the details of this procedure. I also would appreciate an expression of opinion as to the value of this operation for the relief of retroflexion.

We are all familiar with the causes of retroversion, retroflexion and descensus of the uterus, and we know that several conditions may act as causative factors; consequently, no single method of operating can be applied to all cases and to bring about a cure, several operations for repair may be necessary.

The technic of the operation for the correction of retroflexion is as follows:

The patient is placed in an exaggerated Trendelenburg position. A modified Pfannenstiel, slightly curved, transverse incision is made through the skin and fat down to the fascia covering the recti muscles. This incision with its convexity toward the pubes, extends from a point one inch to the inner side of the anterior superior spine of the ilium, to a like point on the opposite side, on a line with the upper border of the pubic hair. The resulting scar will come in the fold of the lower abdomen, just above the pubes, and on account of the location of the wound it is scarcely noticeable.

It has been said, that the Pfannenstiel incision has been advocated principally for cosmetic reasons, as though these could be a matter of indifference, or minor importance to the patient.

Should we not make special efforts to avoid the unsightly scars so frequently

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seen, following the median incision, namely, the wide scar, the depressed areas, pigmentation, keloid, bulging from atrophy of muscular structures due to nerve injury; however, there are other advantages to the Pfannenstiel incision, the most important of which is the lessened tendency to postoperative hernia. Then, too, the convalescence is shortened, as the patient may leave the bed earlier and an abdominal binder is not required.

Continuing, the flaps are dissected upward and downward for a distance of about five inches. A second vertical incision is made near the median line, at right angles to the original incision, through fascia, rectus muscle and peritoneum. A careful examination is now made of the abdominal contents and any pathological condition found is corrected. When the uterus is replaced in the normal anteverted position the round ligaments are observed to be lax and of too great length to be of material assistance in holding the uterus in the new, yet normal position.

The salient features of this operation are that the bladder is first detached from the anterior surface of the uterus and then sutured to it in such a manner, that the upper portion is attached to the upper anterior surface and fundus of the uterus.

The steps of the operation may be summarized as follows:

1. A transverse incision is made through the peritoneum, one-half inch above the upper attachment of the bladder to the anterior wall of the uterus.

2. The peritoneum and bladder are now separated from the uterus as far as the junction of the cervix with the vagina, in a manner similar to that employed in separating the bladder from the uterus during operations for hysterectomy.

3. The bladder is then pulled upward and attached by four interrupted chromic gut sutures passed through the bladder musculature and the anterior wall of the uterus at points just below a line drawn between the uterine attachments of the round ligaments.

4. The flap of peritoneum which was reflected just before separating the bladder from the uterus is fixed by four interrupted catgut sutures to the fundus of the uterus, or to the posterior part of the fundus.

5. The abdominal wound is closed with a continuous suture of catgut in the peritoneum, a double chromic catgut suture in the fascia, plain catgut in the fat and interrupted dermol sutures in the skin.

The operation of freeing the bladder from the uterus and raising it, so that it pulls upward the anterior wall of the vagina, aids in the cure of retroflexion, vesicocele and slight prolapse of the uterus.

When I first considered this operation, I realized that the round ligaments were lax when the uterus was brought forward so I devised the following technic for shortening the round ligaments:

An incision two inches in length is made through the peritoneum covering the uterus and round ligaments, the center of which incision lies over the insertion of the round ligaments into the uterus. The edges of peritoneum along the incision are retracted and the uterine portion of the incision deepened sufficiently to receive the round ligament about to be embedded in it.

The round ligament, freed of its overlying peritoneal covering, is now grasped with forceps and drawn taut in the direction of the uterus, thus taking up the slack. The loop of round ligament resulting from this procedure is fixed in the slit in the wall of the uterus, by three or four chromic gut sutures. The peritoneum is then drawn over the ligament and united with a continuous, plain catgut suture. The opposite round ligament is treated in a similar manner.

CONCLUSIONS

Attaching the bladder to a higher position on the uterus has the effect of holding the uterus in a normal, anteverted position and of raising the anterior vaginal wall.

Shortening the round ligaments by the method here advocated has the advantage of retaining the original attachments of the round ligament, so that traction upon the fundus of the uterus is normally applied.

262 BLACKSTONE BOULEVARD.

(*For discussion, see p.* 435.)

Society Transactions

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS

THIRTY-FIFTH ANNUAL MEETING

ALBANY, NEW YORK, SEPTEMBER 19-21, 1922.

(*Continued from March issue*)

DR. A. M. MENDENHALL, INDIANAPOLIS, IND., presented a paper on **Craniotomy.** (For original article see page 372.)

DISCUSSION

DR. ADAM P. LEIGHTON, PORTLAND, MAINE.—I still adhere to the few remarks I have previously made relative to craniotomy. I do not wish to appear disrespectful, but there are cases, possibly, in hospital treatment, brought in to you where craniotomy may be indicated. Unfortunately, I have no general hospital clinic, and I can imagine possibly a case in the country which might be so bungled that craniotomy might be the way out. The possibility of a dead baby may offer an indication for craniotomy, but if that intrauterine death was due to my bungling or carelessness, I should dislike to finish the picture! I do not see any particular reason for allowing the woman to get into such a condition that craniotomy might be indicated.

DR. WILLIAM PFEIFFER, BROOKLYN, NEW YORK.—Dr. Leighton has not a hospital service where cases are handed to him, seriously compromised but those who have such service are up against it. There can be no difference of opinion in regard to the dead child. With regard to the living child, I beg to differ with him except in the case of hydrocephalus. As an obstetrical proposition, it is not sound judgment. I think there are other methods of delivery. In a recent Johns Hopkins Bulletin, there is an article by Harris from Williams' Clinic, showing in 243 cesarean sections, 28.7 per cent hysterectomies performed with a very small mortality and delivering in most instances a live child. E. P. Davis and Williams do hysterectomies upon cases that have been examined once or twice considering them infected cases.

As to the case of the operation, it is not so easy as the doctor sets forth. After the child's head is perforated, the cephalotribe does not always hold, and occasionally it will be necessary to apply it three or four times before a good grasp can be obtained.

In a recent case of very badly bungled perforation, an attempt at forceps had been made before the cephalotribe was applied, and version had also been attempted. The child was in transverse presentation, with a high contraction ring, and the woman almost pulseless. It was difficult to complete the perforation and to make the extraction. The woman died in twelve hours. That is nothing against the operation because it was a badly selected case. We cannot say which child will survive and which will not in operating on them by abdominal route and I hesitate to perforate the head of a living child.

DR. EDWARD SPEIDEL, LOUISVILLE, KENTUCKY.—The operation of craniotomy is performed so infrequently by most of us that unless conditions are very fair, it becomes a more dangerous operation than the three which we substitute for it—version, high forceps, or cesarean section. Consequently in anything more than a moderately contracted pelvis it becomes a serious thing to do a craniotomy. I do not know whether the essayist included transverse presentations in considering the subject or not. The majority of destructive operations that we have been compelled to perform in the City Hospital in Louisville have been in neglected transverse presentations where we have an impacted dead child, with an arm hanging out of the vagina and the waters drained away. In those cases I find it an easy thing to deliver by amputating the arm. I have never met a case that did not occur in a multipara. The arm can be pulled down to the vulva, the anterior vaginal wall protected by a retractor, and with scissors curved on the flat, the arm can be cut away from the shoulder; then it is easy to reach the leg and bring out the child. I have done this six or eight times and in no instance was there any difficulty with the aftercoming head.

DR. WILLIAM D. PORTER, CINCINNATI, OHIO.—The essayist spoke against version, stating that it is contraindicated in those cases in which craniotomy was applicable. There is one condition, however, which he mentioned in which I think craniotomy and version will enable us to handle the case better than in any other way, and that is in hydrocephalus. In these cases it is easy to perforate the head, but the flaring cranial bones are difficult to deliver satisfactorily. They are easily handled if, after perforation, you do a version, and as the head comes into the pelvis the bones come together, the brain is extruded and the delivery is a simple process.

DR. ARTHUR H. BILL, CLEVELAND, OHIO.—I dislike to go over what I have already said in regard to perforation of the head. What I said did not concern the dead child but the living child. In cases in which Dr. Mendenhall says there are contraindications to the use of cesarean section of any variety, I do not feel that we are justified in destroying the child when we have a means of delivering it through the pelvic cavity by enlarging the bony girdle. To my mind sawing through the pubic bone, which is an operation entirely outside of the genital tract, outside of the vagina, the uterus and peritoneum, does not complicate the situation in regard to infection, or materially add to the danger. I cannot see any reason for saying that pubiotomy is contraindicated in cases that have been neglected, that is the so-called potentially infected cases when the child is still alive and in good condition. I laid emphasis on pubiotomy as an emergency procedure. Perforating the head of the living child to my mind is about the worst thing we can do in obstetric practice.

DR. MENDENHALL (closing.)—In reply to the remarks of Dr. Leighton, I would refer him to the fourth conclusion in my summary. You have no predecessors on your cases, you acknowledge. Those obstetricians who are doing clinical or charity work get cases under altogether different conditions from what you get your cases. I hope it will not be necessary to do craniotomy upon my private cases. I have yet to do a craniotomy on my own case. That is a different question from the cases that are sent in to us.

Some one mentioned transverse presentation. I did not say anything about that phase of the subject as it does not enter into the question. If it did, we would talk about brow, face, and so on. Any presentation can be taken care of by some other method, by Braxton-Hicks version, internal podalic version, or by cesarean section. There must be more indications than transverse presentation to warrant embryotomy or a mutilating operation.

Dr. Porter spoke of version. We find that even though the baby is dead, some practitioners resort to version to deliver that dead baby. That was the only thing I brought out in my paper regarding version, which to my mind is contraindicated. Ordinarily this dead baby represents a labor that has existed for some period of time, and after it is discovered it is dead, I believe no one is justified in doing either a cesarean section or a version. Nevertheless, there are a great many operators who do version on a dead baby with a prolapsed cord for example. That is absolutely contraindicated. That is the only thing I brought out in connection with version.

DR. W. S. BAINBRIDGE presented a report of a **Case of Double Salpingo-oophorectomy with Partial Autotransplantation, Followed by Twelve Years of Menstruation and Pregnancy.** (For report, see page 379.)

DISCUSSION

DR. STEPHEN E. TRACY, PHILADELPHIA, PA.—I would like to ask Dr. Bainbridge, how soon after the abortion the operation was performed? In patients in whom there has been an infection following an abortion, it has been our custom to avoid operation for several months. If the infection has not entirely died out, operation may light it up with serious results.

I would like to know also if the ovary was entirely separated from its former attachments? In other words, was the blood supply entirely cut off before the ovary was transplanted? We frequently suture an ovary to the cornu of the uterus when both tubes have been removed, but we try to preserve its blood supply.

Several years ago I assisted at an operation for acute gonorrheal infection of the pelvic organs. The surgeon intended to remove both appendages, but in ligating the right side a small piece of ovary was included in the ligature and allowed to remain. The pelvis was drained through the lower end of the incision. Two or three years later the surgeon was advised that the patient had married, had conceived promptly and had given birth to a healthy child.

DR. W. WAYNE BABCOCK, PHILADELPHIA, PA.—I wish to report two cases in this connection; one a young woman did not desire any future pregnancy. Both ovaries were resected freely and she was told that she would not become pregnant. However, she became pregnant the following year, and bore a living and healthy child.

The other case was a young woman who had extensive inflammatory disease in which we thought it was impossible to save anything except the uterus. The adhesions were exceedingly extensive, and we removed both tubes and ovaries as we thought, but two years later the patient became pregnant. How she became pregnant we do not know. Despite our care in trying to do a complete operation we had left in a piece of the ovary and did not know it. That seems to be a rather difficult thing to tell in some of these cases of ovarian transplantation. Maybe Dr. Bainbridge can tell us how he knew none of the ovarian tissue was left at the normal site or left in the adhesions in the region of the normal site.

DR. TRACY.—May I ask Dr. Bainbridge what material he used for his ligatures?

DR. JAMES N. WEST, NEW YORK CITY.—I would like to ask Dr. Bainbridge regarding the patient's labor, if he had attended the patient in labor, or if he has any history of the labor? The reason I ask this question is because it is an extraordinary case, and one should look at it from every point of view.

I was a witness in a unique case in which a woman was accused of the crime

which is technically known as "forcing a spurious heir." This woman went into a house where confinement cases are taken; went to bed, had a placenta, and a baby brought from the next room. A doctor looked at the placenta and baby, and gave a birth certificate. I had examined this woman two months before for menorrhagia. The uterus was not more than normal size; she had excessive periods. She was supposed to have had a full term healthy child, and it became quite a noted medicolegal case in that it was necessary to have a trial of such a kind that there would be opportunity for a doctor to testify without violating the law in regard to privileged testimony. It took the form of an action instituted by the Board of Health to change the name of the baby. In that way testimony could be given which in a regular trial could not. The case was tried before the Corporation Counsel of New York. The woman fled after my testimony and never was arrested, and the supposed father was released from legal responsibility as the heir was proved spurious. The woman's case broke down toward the end and she confessed she had done this very thing. Many cases have occurred where women have produced spurious heirs to palm off on their husbands. I would therefore like to know something about the labor in the case reported by Dr. Bainbridge.

DR. BAINBRIDGE (closing).—In answer to Dr. Tracy's question, the patient came under my care some weeks after her miscarriage. She was treated expectantly for some time prior to operation, rest in bed, topical applications, etc.

In reference to the question as to whether or not some ovarian tissue may have been left *in situ*, this was impossible. When the masses had been excised, there was nothing left but the uterus,—the tubes, ovaries and even most of the ligaments had been removed.

Regarding the ligature material, I used simple, fine catgut to attach the stroma *in situ*, with fine, black linen for the peritoneum.

Dr. Babcock spoke about the completeness of the operation. I think there is no question but that these masses on both sides left the uterus practically without very much support.

In response to Dr. West's question, there was no uncertainty as to the paternity of the child. The family physician who was the accoucheur in this instance, assured me there was no doubt.

DR. W. W. BABCOCK, PHILADELPHIA, PA., presented a paper entitled **Transplantation of the Cervix.** (For original article see page 380.)

DISCUSSION

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—The doctor said the patient came back to this country after having been delivered in England. Did you have an opportunity to examine the cervix afterward, and if so, what was the condition after delivery? The thought occurs to me that the cervical canal was transplanted from the normal circular muscular fibers around it back through the muscle, where the muscular fibers would be almost transverse, and what effect did that have on delivery, and what was the condition of the cervix after delivery.

DR. STEPHEN E. TRACY, PHILADELPHIA, PA.—The procedure recommended by Dr. Babcock, is an excellent one in the type of case under discussion. Some years ago I operated upon a patient who had a badly traumatized cervix with much scar tissue. After the scar tissue had been dissected out, there was not sufficient tissue to cover the amputated cervix. In that case we separated the vaginal wall all around the uterus, split the posterior vaginal wall about 3 cm., and moved the

cervix back. The denuded area was then easily covered and the operation gave an excellent result.

DR. BABCOCK (closing).—Examination of this patient showed a transverse laceration of moderate degree, such as we find in the average patient who has borne a child. If I had known she had this transverse laceration, I might have done otherwise. I thought she had a normal cervix except that the cervix was not well invaginated. Of course, the mucous membrane overlying the cervix is so thin and so elastic that apparently it was not deformed in any great degree.

DR. JAMES N. WEST, NEW YORK, N. Y., presented a paper entitled **The Pernicious Effects of the Intrauterine Stem Pessary.** (For original article see page 383.)

DISCUSSION

DR. HERMAN E. HAYD, BUFFALO, NEW YORK.—Most physicians do not realize the danger of introducing a sound into the uterus. That is one of the reasons why Joseph Price spoke so strongly against all kinds of intrauterine tinkering in the shape of curettage and the introduction of sounds. Price taught, the curette and sound were seldom or never necessary, and therefore, always capable of doing much harm. However, I believe that is going too far, just as I think Dr. West goes too far in condemning the stem. I am satisfied the sound, when used carefully and judiciously, can be a useful instrument, and I am satisfied that curettage is often a very necessary operation.

So far as the stem pessary is concerned, there are many things that we may do but cannot teach too freely. I believe occasionally there are cases, if carefully studied, where the stem pessary is of great value. I have used the stem pessary quite frequently. I have seen a number of cases after a curettage and dilatation, say in three to six months, where the cervix recontracted and the dysmenorrhea returned, and then I dilated again and put in a stem pessary. The canal remained open, the dysmenorrhea was relieved, and I can report one case where after a number of years of sterility, she became pregnant and had a full term baby. Therefore, I would not like to take the position that the stem pessary is absolutely useless. I do believe occasionally it is of great value and should only be employed by men who will realize the dangers in its application and will remove it at once if it causes undue irritation.

DR. GRANDISON D. ROYSTON, ST. LOUIS, MISSOURI.—I should like to ask Dr. West to define a pathologic anteflexion that would require amputation of the cervix. Another question: Would he amputate the cervix for dysmenorrhea in a young, unmarried girl. We all see young unmarried girls in whom bimanual examination fails to reveal anything in the way of uterine displacement, anteflexion, or retrodisplacement, yet they have dysmenorrhea. Many of these cases are really occupational disorders. We find cervical stenosis if we are to believe the statement of Sellheim that the normal diameter of the cervix is four millimeters, and when the canal measures less than that some obstruction may be expected. In such cases a simple dilatation and curettage have not been uniformly successful in my hands. I have been using the intrauterine pessary in unmarried women, where there is no infection. The patient is warned not to take any douches, and we assume she will not be exposed to any sexual infection. The use of the Carstens' intrauterine pessary has been successful in relieving the majority of these patients of dysmenorrhea. In ten years I have not seen any infection follow its use. Only this month I de-

livered a case who had one of the spiral gold pessaries inserted in Chicago for producing sterility. She was three months pregnant when seen and the pessary was still *in situ*. She had paid forty dollars to prevent that pregnancy. Some years ago where I was working in a dispensary, an intrauterine pessary was inserted in a patient for the cure of sterility. This patient developed a streptococcus cellulitis and almost lost her life. Any pelvic infection contraindicates the use of the pessary. I think where such a pessary is used, the woman should be warned against intercourse; she should take no douches during this period, and she should always be under observation.

DR. JOHN OSBORN POLAK, BROOKLYN, NEW YORK.—During last year we have had six cases of general peritonitis brought into our services resulting from the use of the intrauterine stem. I will admit that when these cases were carefully investigated they show that the stem should not have been used. An important point is the absence of infection, but with the cervical glands built on such a histologic plan as they are, having the power to retain infection for a very long time, particularly if that infection is a streptococcic infection, and we know that a very large number of these infections are streptococcic, the stem pessary seems to light up the condition. A large number of cases of parametritis, result definitely from intrauterine treatment by sounds or stems, and at operation one finds about the ovaries and tubes, not endosalpingitis but perisalpingitic and periovaritic disturbances the result of intrauterine cervical treatment and the use of the cervical stem. There is no question that there is a certain class of malformed uteri in which the stem, in the absence of infection, will relieve the dysmenorrhea and develop the size of the uterus. That is admitted, but I am frank to say that we cannot tell exactly the class every time.

DR. EDWARD J. ILL, NEWARK, NEW JERSEY.—I think my friend Dr. West is rather severe on us chaps who are old and are using the stem pessary. I want to take exception to some of the statements that have been made. Extreme views are apt to be erroneous. Anybody who uses stem pessaries, as I have shown to the members of this Association, must have difficulty. These pessaries invite infection. The pessary that has been exhibited is not the sort of pessary one should use. Take a patient who has not had infection, often a simple dilatation may suffice. Our patients are very carefully prepared. They are just as well prepared for that as they are for a major operation. That is a *sine qua non*. The uterus is very carefully dilated to a No. 36 French, and curetted when necessary under constant irrigation. No weight ever touches the part. The glass stem is No. 34. This glass stem never reaches the fundus of the uterus; it is within a centimeter of the fundus of the uterus. It is held in place by iodoform gauze which is left for three days, then renewed, and in six days it is all removed. I can see harm from any intrauterine pessary which is left in for weeks and months. There is no question about that. Where the patient is kept in bed under careful observation anything serious rarely happens.

The last serious case I heard about was a young woman who was sterile. She had dysmenorrhea. I put in a pessary and she left the hospital in good shape. She returned in three weeks with the pessary; she developed an abscess for which she was operated on. When we examined the pus we took out it contained a multitude of cocci. If I had not examined her I would have failed in the operation. That sort of thing must be considered. If you leave a stem pessary in for weeks and months, and say that patient must not have intercourse, you invite other things.

DR. HUGO O. PANTZER, INDIANAPOLIS, INDIANA.—We are all familiar with the baneful effects of intrauterine stems, and their inordinate use has been well put forward in the paper. I would endorse all that has been said since in the dis-

cussion. I have used intrauterine stem pessaries in cases of this sort. Given a woman who has a uterus like this, (indicating on blackboard), with immature development at puberty, you have here an attenuated uterine musculature, and ofttimes the uterus is held in a malposition and exhibits undeveloped musculature. Under proper antiseptic precautions, in a case that is not already infected, you can put in the intrauterine stem for a short time.

DR. WM. S. BAINBRIDGE, NEW YORK CITY.—I would like to ask Dr. West if he does not think that in our attempt to rid ourselves of the stem pessary, we may not, in some cases, run a greater danger along another line? I have seen a number of cases, young women who have had amputation of the cervix, in which the sterility was not overcome, and others where pregnancy did take place, but with severe dystocia resulting from the amputation.

DR. JAMES K. QUIGLEY, ROCHESTER, NEW YORK.—About six months ago the most popular exponent of contraception was in Rochester and a special meeting was held for the enlightenment of physicians, and about twelve of us attended. This woman showed all contracept devices, and among them was a gold wire Y-shaped stem pessary. One physician in New York she said had approximately 200 cases under observation where he had introduced the stem pessary. A short time after that I had a patient, the mother of two children, who had been to New York and evidently became inoculated with some of these pernicious contraceptive ideas and had one of the pessaries introduced into the cervix. She came to me complaining of pain and hemorrhage. I put her on the table, examined her, and said, "You have had a stem pessary introduced." She replied, "Yes." I said to her, "You paid for it," and she replied, "Yes," and I said, "Unless you have had it removed you have been 'sold' because you have no stem pessary." She said, "I am sure I have it because I have considerable pain." I explored the cervix; the button at the bottom had bent upon itself. The stem is very pliable, and the button was within the cervix well up toward the internal os. She had no infection following its removal and not much pain.

I should like to protest against the amputation of the cervix in a childbearing woman, not alone on the ground of sterility but on account of dystocia afterward.

DR. BENJAMIN RUSH McCLELLAN, XENIA, OHIO.—Where there is a sharp uterine flexion with a short anterior vaginal wall I certainly would not think of using a stem pessary. The unhappy result in one such case is a lesson never to be forgotten. The best way to deal with such a case is first of all to lengthen the anterior vaginal wall by dissecting it loose from the cervix and reattaching it at a much higher level. This gives the cervix uteri a chance to drop into the posterior fornix and tends to straighten the uterine canal. The operation is comparatively simple and entails a minimum of risk. Even where this condition is associated with hypoplasia, which is so often the case, this simple operation should precede further treatment of the latter condition.

DR. ARTHUR T. JONES, PROVIDENCE, RHODE ISLAND.—I want to mention the case of a young woman who came to me with one of these "gold brick" wish bone stem pessaries in. She said she had been wearing this pessary for about two years, evidently with the idea of preventing conception. She was told that they had some gold pessaries, and for $75.00 a New York doctor would put in one of the "solid gold ones." She had been wearing that gold one for more than a year; she was having constant bleeding. She was sent to me, I examined her, and found an intrauterine solid gold pessary in there, but through the central opening of the flange which fits about the cervix was a mass of spongy tissue. I removed the pessary, and sent her to the hospital and curetted her. She insisted upon leaving the

hospital on either the fourth or fifth day, and by the time I got my pathologic report back she had gotten from under my care and had gone to Europe. The report of the specimen was that it was "probably malignant." I felt myself that the case was malignant and in this case a malignant condition was probably set up by the prolonged use of this pessary.

The glass pessaries I have used to develop a small uterus and to give the woman a chance to become pregnant.

DR. ADAM P. LEIGHTON, PORTLAND, MAINE.—Since some remarks have been made about the introduction of stem pessaries for bringing about abortion, I cannot help taking this opportunity to mention the technic a certain Portland lady made use of in bringing about an abortion and the retention of this foreign body for a considerable length of time. I was called to see a woman who had a foul vaginal discharge and found she had never borne any children. I put my finger up in the fornix of the vagina and found seeming scar tissue in the left part of the cervix and in the vault of the vagina. I thought it was an old tear. I swept my finger up into the fornix and pulled forth an eight inch piece of insulated copper wire which had been inserted and left in the uterus and vagina for fourteen months. She had produced an abortion fourteen months before. This copper wire was deeply embedded in the cervix and wall of the vagina. Following its removal she made an uneventful recovery.

DR. ROLAND E. SKEEL, LOS ANGELES, CALIF.—Dr. Ill and Dr. West are discussing two different matters. Dr. Ill is discussing the retention of the stem pessary for a short time, under close observation, and after thorough preparation as for any surgical procedure; and he retains the stem in the uterus with iodoform gauze, which is quite different from inserting a stem and leaving it in the uterus for several months. For some time my immediate colleague was a firm advocate of the stem pessary, but in one year I had to remove the pelvic organs of at least two of the patients in whom the stem had been retained for a considerable period of time. It seems to me if the men who use the stem pessary could always get their patients back when damage resulted, they would exercise more care in its use or discontinue it altogether. A woman who leaves the hospital with a stem pessary, wears it three or four months, and then develops an inflammatory condition of the uterus frequently fails to return to the physician who inserted it, so that he is not aware of his bad results and persists in the same plan of treatment. It is this class of patients Dr. West is discussing and not the carefully guarded patient whom Dr. Ill mentions.

Next as to anteflexion, we may grant there are a great number of cases of anteflexion; in fact, I believe that most nulliparous women have anteflexion, but in my own mind I am unable to associate this anteflexion in a causative relation with dysmenorrhea.

Having overcome the anteflexion one cannot promise that the dysmenorrhea will not return and be as bad as before. It may relieve for from three months to a year, but unless pregnancy supervenes no permanent good will have been done. We do not curette patients with scanty, rather than profuse menstruation and the operation thus consists of nothing more nor less than a simple dilatation, which in turn is nothing more nor less than nerve stretching. The same relief from pain occurs when we stretch the sciatic nerve for protracted sciatica. Certainly we cannot predicate any obstruction, for we have all seen these patients when menstruating and observed the blood oozing from the cervix in a steady stream, quite different from the spurt which would occur if there were an obstruction which was overcome by the painful contractions of the uterus. Conversely, while we understand that the internal os is in some manner a barrier to ascending infection, it is hard to

imagine a cervix from which the blood trickles out offering any barrier to the ascent of a motile spermatozoid. Perhaps we can develop the uterus by the stem pessary used as Dr. Ill suggests and if this will cure the ordinary type of dysmenorrhea we should proclaim it from the house tops, as I do not know of any patients who come to the office of the gynecologist more often and leave with as little satisfaction, as young girls with dysmenorrhea.

DR. WEST (closing).—I have seen two young women die of septicemia, probably the result of the use of the stem pessary and have been called in consultation in several cases where the women have barely escaped death. The condition for which the stem is used is a minor one for which the patient is subjected to the danger of the use of a stem.

This whole subject brings to mind evolution. In the evolution of animal life we had one period known as the molluscan, where the mollusks were the chief group of animals on earth. That lasted for a certain time and was succeeded by the reptilian period which predominated. Finally it came to our time when mammals predominate. Our evolution in surgery should have brought us to the abolition of stem pessaries and those who continue to use them represent our reptilian or second period.

This pessary is from Gaillard Thomas. He made one of these pessaries. It is a ridiculous looking thing, and nobody would think of using it now. There are other stem pessaries in this collection which no one would advocate the use of, but they have most distinguished names. Dr. Peasley was one of the fathers of gynecology, and many of us use his instruments today, but we should not use the stem because Dr. Thomas and Dr. Peasley advocated stem pessaries in those days. This is a case where evolution is taking place, and I am trying to help evolution along a little by condemning the use of stems in the uterus for any considerable time on account of the damage they are liable to produce.

Doctors used to curette patients in the office without any preparation. Some good men did that. They do not do it now. All women did not die from this procedure. If they did, practitioners would never have done it a second time. A good many women survive the use of different kinds of stems. A large number survive with damaged parametria, like the beautiful young married woman whose case I have reported. Some of them die of septicemia, and why should we continue to use such stems? One of the chief advocates in modern gynecology admits that these stem pessaries are dangerous and should be carefully watched. Then what should be done where formerly a stem would have been used? This brings us to the subject of amputation of the cervix. I want to say a few words about that because I mentioned it in my paper as one of the methods of relief for dysmenorrhea and sterility.

I would like to answer all the questions in a short time and think what I am going to say will cover the ground without making individual answers.

Quite a large number of young women have anteflexion. When the anteflexion is considerable it becomes pathologic, and often these patients develop dysmenorrhea. These extreme forms of anteflexion are undoubtedly deformities; they are developmental troubles. The uterus as it develops in the young girl, when she is just coming to puberty, develops against a short posterior vaginal wall.

Here is a uterus, with a very complete flexure. You will always find a short posterior vaginal wall, and the anteflexion may be severe. If the uterus develops normally or develops nearly in a straight line, there is a good big space back of the cervix. What happens is this: the girl in her development does not develop the vagina properly, and as the uterus grows the cervix meets with obstruction and turns toward the point of least resistance which is the canal of the vagina; it turns upon itself and creates an acute flexion. I have amputated the cervix at the point where the acute anteflexion is, and the tissue at the point of flexure is

almost like scar tissue; it feels almost like cartilage; the musculature is almost gone or so atrophied that you can scarcely find it. We know that the cervix is well supplied with filaments of sympathetic nerves. These filaments when anteflexion has occurred are pressed upon in this part of the cervix just like they would be in scar tissue of the cervix after a laceration. The result is tissue which will not dilate when the uterus dilates with the congestion of the menses, just the same as any organ which has a tight capsule is subject to pressure when inflamed. These sympathetic nerve filaments are involved in the tissue which cannot dilate with dilatation of the rest of the uterus and while the pressure exists the patient suffers pain and cramps. Anteflexion is quite common but most of these young girls that come in for its treatment will be relieved if they become pregnant, and if a girl suffers very much we give her an analgesic to relieve pain for a few hours during the worst of the dysmenorrhea.

Then comes the more severe type of dysmenorrhea where the anteflexion is acute, and the patients suffer extremely. Sometimes such a patient will be hysterical. I have seen cases where they would actually become insane for a short time. Cases of this kind have led me to study the causes of pain in dysmenorrhea of anteflexion. Such is the following case of acute anteflexion. Dilatation will relieve about 40 per cent of these cases, but 60 per cent of them in two or three months will be as bad as ever. Forty per cent will be relieved sufficiently not to require further procedure. This little French girl whose mother was a widow, and for whom the necessity of earning her own living was absolute, suffered extremely from dysmenorrhea. She lost one position after another as a result of the disability. I had dilated the cervix well, and she was much better for two months, then the trouble returned with all its force. I was requested to remove the ovaries and tubes. They thought she would have to go to an insane asylum, and I was urged to do anything I could for her relief. I amputated the cervix quite high, and the result was remarkable. She has not had any more dysmenorrhea; she has been cured absolutely. A short time afterward she got married and had one abortion after another. Finally she became pregnant, and on account of pernicious vomiting of pregnancy, I put her in the hospital. She finally carried a fetus to seven months because she was kept in bed and treated carefully for pernicious vomiting of pregnancy. The baby died. I got rid of the dysmenorrhea without removing the ovaries, as she and her mother wanted me to do.

This was my pioneer case of amputation of the cervix for dysmenorrhea and I had amputated so high as to interfere with the function of reproduction. In later cases I leave about one-third of an inch of the cervix below the internal os, which gives excellent results.

Dr. G. Van Amber Brown, Detroit, Mich., presented a paper entitled **Kidney Structural Changes in Early Years.** (For original article see page 358.)

Dr. H. D. Furniss, New York, N. Y., presented a paper entitled **Diagnosis and Treatment of Tuberculosis of the Kidney.** (For original article see page 386.)

DR. R. T. MORRIS, New York, N. Y., presented a paper entitled **Bladder Surgery in Relation to the Fourth Era of Surgery.** (For original article see page 392.)

DISCUSSION ON THE PAPERS OF DRS. BROWN, FURNISS AND MORRIS.

DR. JOHN OSBORN POLAK, BROOKLYN, NEW YORK.—I know of nothing that is more illuminating than to be told that of the 80 babies the doctor dissected, 63 per cent of them, if they had lived, would have started life with impaired renal function.

DR. ROBERT T. MORRIS, NEW YORK CITY.—In reference to the paper of Dr. Furniss concerning tuberculosis of the kidney, I wanted to try the Bier hyperemia principle in tuberculosis of the kidney. With the idea of ligating the renal vein later, I injected the kidneys of a series of rabbits with tubercle bacilli. At the end of two or three weeks the rabbits were showing the effect. I opened two rabbits and found tuberculosis was well under way, but I was not quite ready to tie the renal vein to carry out the experiment. When I returned after a prolonged period the attendant at the laboratory said the rabbits were all getting hungry and making love in a perfectly natural way. I opened the rabbits that were getting over the tuberculosis by themselves in order to watch the condition. I closed up all but two. In examining them at the end of three months I found there was not one that was not perfectly well. The fact that tuberculosis had progressed up to the point of making the rabbits very ill, and then the rabbits overcame the effect and got well without any treatment is an extremely important point to remember.

DR. JAMES N. WEST, NEW YORK CITY.—Apropos of this subject, I would like to say that about four years ago I had a patient in whose case a diagnosis was made of tuberculous kidney and bladder. The patient suffered a great deal with frequency of micturition; she had lost considerable weight. A good many men have written articles on the early diagnosis of tuberculosis of the kidney and the necessity for it without giving anything further of what they should do when they made an early diagnosis. I placed this patient under such treatment as one would for pulmonary tuberculosis. I carefully instructed her about her health, her diet, and exposure to the sunshine and the fresh air. She was a very faithful patient and carried out my instructions very literally. In a little over a year this woman gained twenty pounds in weight; she looked fairly well but suffered a great deal with her bladder, and she still had from time to time a good deal of pain. She did not sleep well, and looked rather cachectic in spite of an outdoor life, although she had gained in weight. I determined to remove the kidney and a part of the ureter, which was much diseased. I found this kidney was but little more than a shell; it was not functioning; it was purulent and after removal that woman has made a recovery. At present her bladder does not disturb her very much. Her health is much better in every way.

DR. G. VAN AMBER BROWN, DETROIT, MICHIGAN.—Dr. Furniss made a comparison between the value of laboratory methods and the use of guinea pigs in making a diagnosis of renal conditions. I agree with his statements in this connection. In the literature within the last year I was impressed with the report of four kidneys removed on a diagnosis of tuberculosis, which upon microscopic examination failed to show tubercle bacilli. In these cases the diagnosis had been based on inoculation of guinea pigs. The animals may have been tuberculous at the time of inoculation. In two cases nonmalignant tumors of the kidney caused the symptoms, and in two others the kidney was normal but there was a slight apical tuberculous process.

DR. FRANCIS REDER, ST. LOUIS, MISSOURI.—I wish to refer to sinus formation after the kidney has been removed and the healing process about completed. The operation of nephrectomy for a tuberculous condition is one of the most grateful operations. Bladder symptoms, which are frequently secondary, usually disappear after the kidney has been removed. But there is sometimes a distressing feature as a sequel to a nephrectomy for a tuberculous lesion, namely sinus formation. It does not seem to matter much how the stump of the ureter is treated, whether it be treated with a cautery, or whether it be treated with a carbolic acid application, a sinus quite often follows. When Dr. Furniss says the sinus will heal in two or three months, or in a year and a half, it is encouraging for those who meet with this condition. I have several cases on hand at present, one dating back three years. One of these cases was very much dissatisfied and went to the Rochester Clinic two years ago, where an extensive operation was performed. For several months matters looked encouraging, then the sinus again appeared and is active at present.

The best results obtained in the treatment of this condition have been with the injection of bismuth paste (Beck) somewhat stronger, however, than the original formula. With this paste I can usually keep the sinus closed from four to eight months.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—All who have looked over the literature upon the pathology of the kidney will be at once convinced that there is much to be settled. The classification of kidney findings is in many ways unsatisfactory. I think it is of very great importance to have a research study upon this subject recorded before this Association.

The amount of work Dr. Brown has done I think needs special commendation. The material that he has worked upon is excellent, and it offers much in the way of promise that will go far toward settling or helping to settle some of the problems we now have in an unsettled condition.

This kind of material is always abundant. We can always have plenty of bodies of young children to study. It is rather tedious to sit down and make a careful study of the morphology. It is likewise more tedious to make a careful microscopic study of kidney tissue from young subjects. The preservation of this material is exceedingly important. Unless made at least within two hours after death, it will not give reliable material for a careful study. The kidney should be preserved at once; it should be sectioned so that the preservative fluid will reach all parts of the tissue, and the most searching study should be made of different parts of the kidney.

A very important phase of the subject that Dr. Brown has mentioned comes in connection with the infections of early childhood. During the first decade of life most of the infections are encountered, and it is my firm belief that we have a beginning permanent pathology of the kidney laid down during this period. It is true, the changes are so minute that frequently we are unable to be quite sure of their presence, but I am sure that when our studies are carefully done, and we look into the condition of the terminal arteries, and are able to recognize the changes that go on there after or during every infection, and consider the aggregate of infections that come during the first decade, we will then understand how later on we are going to have some of the surprises that are clinically spoken of as "clouds in a clear sky." No one suspects kidney pathology in this or that case, but the reason for the condition was an injury sustained in the first decade of life.

DR. STEPHEN E. TRACY, PHILADELPHIA, PENNSYLVANIA.—We should ever be on the alert to recognize renal lesions. Undoubtedly there are many unnecessary operations done on the abdominopelvic organs when the pathology is in the renal system. Many patients with a calculus in the ureter have been operated upon for

chronic appendicitis. Some years ago a patient who suffered with abdominopelvic symptoms, consulted a gynecologist who repaired some lacerations; the symptoms continued. She then consulted a surgeon who removed the appendix; the symptoms were in no way modified. She later consulted another surgeon who removed the gall bladder; the same symptoms continued. The patient had a tuberculosis of the left kidney, ureter and bladder. The kidney and entire ureter were removed. After the operation the capacity of the bladder increased from 30 to 600 c.c., and she remained in good health for four years when she developed a large ovarian cyst which was removed. She is now in excellent health twelve years after the nephro-ureteroectomy.

Recently we had a similar case. The appendix was removed by a general surgeon. The symptoms continued. Three months later the abdomen was opened by another surgeon for the separation of adhesions which were not present. She was in no way benefited by the operation. She had a tuberculosis of the right kidney and upper portion of the uterus. The ureter was strictured at the bladder. The kidney and the involved part of the ureter were removed and she had a rather rapid convalescence.

The discovery of tubercle bacilli in the urine without other symptoms of a renal lesion is not sufficient evidence on which to base a diagnosis of tuberculosis of the kidney. When operating for a tuberculosis of the kidney and the ureter is involved, if the condition of the patient will permit, the entire ureter should be removed. By so doing the convalescence will be shorter and if a sinus develops, it will heal more quickly.

DR. G. VAN AMBER BROWN, DETROIT, MICHIGAN.—I want to again refer to the edematous twin baby mentioned in my report. This case stimulated me to institute an inquiry in regard to the circulation of the blood of the mother in relation with the circulation of the blood of the fetus, that is, do they intermingle and how intimately do they come in contact? Also how much influence does the kidney efficiency of the mother have upon the baby? Through the courtesy of Dr. George J. Reberdy, of Detroit, I am privileged to cite this case. The patient was first seen April 5, 1922, and delivered the following day, April 6. Menstruation normal, never ill except in childhood. She weighed 150 pounds; had a blood pressure of 122 over 80, and was apparently in good health. Colostrum was present; the position was L. O. A.; fetel heart 140, clear. The measurements of the pelvis and vagina were ample. The woman was twenty-eight years of age, an American, with no occupation. Time of labor 18 hours, spontaneous delivery. The patient has used morphine habitually for eight years. On the day of confinement she had taken sixteen grains, by hypodermic injection, her daily consumption of this drug. Naturally there was much speculation as to the kind of baby she would produce. The child cried lustily, weighed five pounds twelve ounces; was normal in development, but after placing the child to the breast it became stupid and gave evidence of morphine poisoning The baby gradually failed and after some days died. Evidently absorption of the morphine had taken place in that child from the milk of the mother.

At Providence Hospital phenolsulphonephthalein and indigo carmine were injected intravenously into a number of women, at three hours, two hours, one hour, and a few minutes before delivery of their babies. The babies were watched for twenty-four hours afterward during which time every bit of urine was collected, and in no instance was there any evidence of the phenolsulphonephthalein or the indigo carmine passing from the mother into the urine of the child. Yet we have the evidence, as shown in the edematous twin, of the kidneys of a fetus at six months being very active indeed, followed by death of the fetus from suspension of its kidney function produced by back pressure caused by the imperforate urethra. This linked with the phenolsulphonephthalein and indigo carmine tests is strong evidence indicating the lack of intermingling of the blood stream of the mother and

fetus. It further raises the question—are any substances borne from mother to child by the blood stream and if so what? Luetic fetal kidneys do not show medial and adventitial blood vessel proliferative changes that adult kidneys show but the infection manifests itself by proliferation of the interstitial connective tissue. Is this due to the lack of specialization of the connective tissue or is it due to the failure of spirochetal dissemination by way of the circulatory system of the kidney?

DR. FURNISS (closing).—In Dr. Brown's collection there are a large number of malformations, representing a considerable percentage compatible with good health especially duplications of the ureter and of horseshoe kidneys. These will not become apparent unless some disease of the urinary organs occurs which would make investigation necessary. Evidently there is a greater percentage of duplication of the upper end of the ureter than of complete duplications from the kidney to the bladder. These are difficult to discover except by pyelography, or where the surgeon has catheterized the ureter a number of times and gets pus at one time and clear urine at another. I have seen 26 cases of complete duplication of the ureter. In two cases the ureters opened extravesically. One I anastomosed into the bladder from the vagina. In the second case a supernumerary ureter drained a portion of the kidney, not bigger than a small hickory nut. I resected that portion of the kidney with little difficulty and a most satisfactory result.

DR. A. P. LEIGHTON, Portland, Me., presented a paper entitled **Obstetrico-Gynecological Diagnosis.** (For original article see page 415.)

DISCUSSION

DR. EDMUND D. CLARK, INDIANAPOLIS, INDIANA.—I should like to ask Dr. Leighton whether he used the x-ray in making a diagnosis in the second case?

DR. BURNLEY LANKFORD, NORFOLK, VIRGINIA.—Did you make a rectal examination to determine the position of the cervix in the second case?

DR. DAVID W. TOVEY, NEW YORK CITY.—Dr. Leighton mentioned the history of normal menses in his case as ruling out ectopic pregnancy. Ectopic pregnancy is easy to diagnose if you have a history of skipped menstruation and the cardinal signs of fainting, etc., but we frequently get a history of normal and regular menstruation in ectopic pregnancy. There is nothing more difficult to diagnose than ectopic gestation in a case where the symptoms are not regular. I do not think the cervix is of any particular use in diagnosing pregnancy. If the uterus is pregnant, you always get a soft elastic area just above the internal os. It is easy to feel by steadying the fundus of the uterus and inserting the fingers in front of the cervix. You must be sure to wait between the contractions, otherwise you get a hard uterus, because during pregnancy the uterus contracts rhythmically. If you put your finger in the vagina you stimulate the uterus to contract, and sometimes you will get a prolonged contraction, and you will get a hard area, but if you wait a few minutes for the contractions to stop, you will get a soft elastic area there. If the fetus is dead the area is so soft, that it is like putting your fingers into putty.

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—I should like to ask Dr. Leighton whether he made use of blood chemistry in the third case, and further to get an expression of opinion from some of the members as to the value of blood chemistry in these cases of eclampsia, preeclamptic toxemia, or hyperemesis. The further I go in making observations of this complication of pregnancy the more uncertain I am and the more unable I am to make a prognosis or a diagnosis as to the degree of protein overload in the blood. I have found so many times cases of

impending eclampsia coming on without much evidence of increased toxemia, as shown by the blood chemistry, and yet after they have gone through seizures, or after they began to get well the nitrogen retention increases. Our pathologist has come to the conclusion that the blood chemistry lags. Apparently the clinical picture is twenty-four hours ahead of the blood chemistry. The principal picture we have to depend upon is the clinical picture. I have seen a case of eclampsia come on, in labor, that under the most painstaking care and observation did not show the slightest evidence of toxemia.

DR. EDWARD SPEIDEL, LOUISVILLE, KENTUCKY.—I would like to ask the essayist whether he investigated the diet of the patient twenty-four hours preceding the attack of eclampsia. We have many cases in which the final cause seems to be a fat anaphylaxis, as we have cases of eating too much ice cream or of cabbage or greens impregnated with bacon grease as a fulminating cause.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—With reference to the question of diagnosis of pregnancy in the unmarried, I think those of us who have done a good deal of consultation work have had to decide this question sometimes under very embarrassing circumstances. It seems to me, that before we should pass judgement in such a case as the doctor had, it would be well worth while to give the patient an anesthetic and make an examination that would be enlightening.

DR. LEIGHTON (closing).—As regards the question asked by Dr. Brown (Rochester) about the blood chemistry, I admit that I did no more than to examine the urine.

With regard to the question asked about the use of the x-ray, I did not use it. I have used the x-ray in one case, I remember, as an aid to diagnosis, and it worked out well. In this woman a diagnosis of ovarian tumor had been made and preparations to have it removed. To me her case seemed to be clearly one of pregnancy. The x-ray picture showed a seventh or eighth month pregnancy. The vertebrae could be seen. The x-ray in my experience is of little value until the case is within two months of full term, because you cannot obtain a good picture of the fetal bones before that time. I made no rectal examination in the tumor case.

As to the question of ectopic pregnancy in the first case, I knew some of you would mention this possibility. I possibly was too charitable or too gallant to speak of this case as one of ectopic pregnancy, because the patient was a very charming young lady.

I cannot agree with the statement that the cervix is not a good diagnostic sign in pregnancy. When I ruptured the girl's hymen and found a conical, elongated, hard cervix, I knew it was not one of pregnancy. The cervix is a valuable diagnostic sign in pregnancy.

The question of diet is important. Dr. Hastings-Tweedy, of Dublin, in his article, "The Cause and Cure of Eclampsia," says that food is the actual exciting etiologic factor in eclampsia. I have seen it proved myself. So far as diet in this case was concerned, I do not remember anything to which we could attribute the onset.

DR. JOHN W. KEEFE. Providence, R. I., presented a paper entitled **An Operation for Retrodisplacements of the Uterus.** (For original article see page 418.)

DISCUSSION

DR. JOHN OSBORN POLAK, BROOKLYN, NEW YORK.—I saw this operation performed by Rossini a number of years ago, and it has a field in covering myomectomy wounds; but I should like to call attention to one point, namely, carrying the

bladder up high does not keep the uterus forward, as has been shown by the experience we have had with the operation known as the Krönig cesarean section, where the bladder attachment is carried away up on the face of the uterus. I have seen any number of cases come back with their uteri retroverted.

I believe the cure of the retroversion is accomplished by his procedure in shortening the round ligaments, and, of course, there is an advantage in preventing peritoneal adhesions by carrying the normal bladder peritoneum over the face of the uterus. There are times when this procedure should be utilized just as I have suggested, for covering myomectomy wounds, bruises in front of the uterus, but as a cure for retroversion, unless supplemented by shortening of the round and uterosacral ligaments, it will fail because it is wrong in principle.

DR. HERMAN E. HAYD, BUFFALO, NEW YORK.—Dr. Keefe has brought to us an operation that is very interesting, but after all the different operations we have performed for retroversion, and after the successes all of us have had with these operations and the failures which we have been able to attribute to them, I am surprised that he should try to establish this procedure which, first of all, slits the peritoneal covering of the uterus then tears it back and then doubles over the ligament and inserts it into the slot thus formed. No matter how carefully it is sewed over, it leaves a rough spot for future adhesions. He also separates the bladder from the front wall of the uterus which may make a number of permanent striae and folds, and be responsible for a great deal of future irritability of the bladder. I have advocated and employed for many years, plication of the round ligaments and then shorten them just as this Italian surgeon does. Then I sew the uterine end of the ligament into the cornu of the uterus to get a very strong attachment; of course, always being careful not to kink the tube and not to include too much of the ligaments in the bite of the ligature. Then a catgut suture, which will last only a few days is passed through the uterus to hold it up. If the uterus is heavy, it relieves the tension on the plicated area and when there is much sagging of the broad ligament, I insert a few stitches through the uterosacrals. We thus accomplish all that is necessary in the way of extending and elongating the anterior wall of the vagina and we will have occasioned the least amount of traumatism which is productive of so much future suffering from the subsequent intraperitoneal adhesions. A prolapsed ovary should likewise be lifted into place with a suture of fine catgut.

DR. JAMES N. WEST, NEW YORK CITY.—I have recently operated on a patient on whom this operation was done about eighteen months ago. I judge the peritoneum of the bladder was fixed to the fundus of the uterus. She came to the dispensary on account of frequent micturition. We found that the uterus apparently was drawn down by this attachment of the bladder until there was a marked procidentia. The uterus was small and the effect on the retroversion was not appreciable. I tried to do an interposition operation, but found that the bladder fold of peritoneum was too firmly attached to the top of the uterus.

DR. MAGNUS A. TATE, CINCINNATI, OHIO.—In this operation described by Dr. Keefe, I would like to know what becomes of the bladder if the woman should become pregnant?

DR. JAMES F. BALDWIN, COLUMBUS, OHIO.—I have for a good many years used a modification of the Pfannenstiel incision, in cases in which the patient is very anxious to avoid a scar. The modification consists in cutting down to the aponeurosis, dissecting up the flap, and then making the usual median incision. The flap is then brought down and attached to the aponeurosis by under-sewing back and forth with plain catgut, then closing the first incision with two or three

silkworm-gut stitches above the pubes, and the rest with catgut, taking in just the skin. The results, so far as avoiding scar is concerned, have been exceedingly satisfactory.

A number of years ago I advocated elevating the uterovesical fold when operating for the relief of long-standing retroversion. In these long-standing cases the bladder and uterus have pulled from each other so that the bladder is attached down on the vagina and not at all to the uterus. In such cases I cut across the peritoneum, very much as advised by the essayist, dissect the bladder from the vagina with the fold of peritoneum, then reattach the peritonium as high up on the anterior surface of the uterus as it seems wise. No stitches are put into the bladder but it is brought up into approximation and takes care of itself. The chief argument which I advanced in favor of this operation was that it eliminated the deep pocket from in front of the uterus. The intestines thus would not tend to push the uterus back. The round ligaments are shortened of course as necessary.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—I wish to call attention to the fact that while the object is accomplished in a new way, the principle is old. It is the same as that employed by Dührssen and Winter in connection with vaginal fixation in 1892 of bringing the uterus forward. It is the vagina that holds it forward, and not the bladder. The vagina is a stronger and more fixed organ, and if the uterus is held forward, it is done by the vagina and not by the bladder, and not by the peritoneum which will not hold anything.

This operation and all operations that shorten the round ligaments intraperitoneally have the disadvantage brought out by Dr. West, namely, they pull the uterus downward and forward instead of upward and forward where we want it. The only operation that pulls it upward and forward is the Gilliam operation or some modification of it.

DR. DAVID W. TOVEY, NEW YORK CITY.—I do not see the advantage of the modification of the Pfannenstiel incision that is referred to by Dr. Keefe. One of the principal advantages that Pfannenstiel claimed for his incision is to prevent hernia. If you cut through the fascia vertically under the skin, you have nothing but the skin to hold the intestines back and I do not see why we should not produce a hernia with this incision the same as with a vertical incision. Stanton, of Schenectady, collected the statistics of a number of large hospitals of the country and found from 2 to 10 per cent of hernias following the vertical incision in clean cases. Pfannenstiel up to the time of his death had published 5,000 cases in which his incision was used without a hernia. I know of only one case operated on by the Pfannenstiel incision in fourteen years that was followed by hernia, and that was a case of carcinoma where a large abdominal drain was left in and hernia followed. If you make the incision and dissect up a flap and do not cut all branches of the twelfth nerve that go to the fascia and supply it, you will not produce a hernia. In separating the fascia from the rectus you get rid of the rigidity in the recti and can draw the recti to the spines of the ilium so that you have taken all tension out of it.

It has been pointed out that one of the disadvantages of the Pfannenstiel incision is that it presents difficulties if infection sets in. Such is not the case. I find the incision heals more kindly than a vertical incision, because the fibers of the skin and fascia run transversely and tension causes the wound to close. If the patient during the operation should strain or vomit, you will see the incision come together.

DR. ROBERT T. MORRIS, NEW YORK CITY.—A great many abdominal operations may be done in fifteen minutes through the short incision. You cannot do that with a Pfannenstiel incision. In the second place, if you have a patient who

does not relax, whose abdomen is rigid as sometimes occurs, it is difficult to make a very good repair if the Pfannenstiel incision is employed. In the third place, every operator gets primary union, but the other fellow does not. I have had to repair two cases in which infection occurred after a Pfannenstiel operation. Both of these patients have been reported as cured by the original operator, but they are not yet cured.

DR. RUFUS B. HALL, CINCINNATI, OHIO.—I cannot see the logic of why we should repair the round ligament and leave stitches when it is feasible to shorten the round ligament by modification of the Gilliam operation, and bring the external part of the ligament through the inguinal canal; that does all that can be done, and leaves the patient's abdomen intact, so far as the round ligaments are concerned.

DR. KEEFE (closing).—Professor Pestalozzi told me he had performed this operation more than one hundred times with success.

It is natural for men who have not done an operation to condemn it theoretically, whereas the other fellow who has done a hundred of these operations may see the value of it. I was impressed with the skill with which this man operated, and I feel this way about it myself: that in women in the childbearing period it may not be well to put the bladder on top of the uterus. In women beyond that period I think it might be so utilized.

It is said that the vagina holds the bladder up; others say it is the floor of the pelvis that holds the uterus up.

I showed a picture in the beginning of my paper of a normal uterus lying right on the fundus of the bladder. If we insert two or three stitches, uniting the bladder to the uterus, then when the bladder is filled the uterus is raised; but normally it is resting on the bladder. I have not heard anyone put forth any convincing argument that this procedure is not of value.

I was very much impressed, and am yet, with the Alexander operation. A great many men say, you must open the abdomen; you may find something the matter with the tubes or ovaries. I believe that a specialist in gynecology ought to be able to determine whether there is any serious trouble with the tubes or not. If he cannot make it out, he had better not do abdominal section. There is a large field for an operation like the Alexander operation. It has been my privilege to have listened to some eminent gynecologists of earlier days when the operation of shortening the round ligaments by the Alexander operation was first developed. Professor Polk was one of the men who advocated it. Professors Munde, Lusk, Emmet, and others advanced arguments to the effect that the round ligaments had nothing to do with it. Emmet would not say that they had a lifting up property. Whenever you use the Gilliam operation and hold the uterus up to the abdominal wall, it is not a natural position at all. The nearer we come to what nature has done, the nearer we will come to something that is worth while. When we shorten the round ligaments in the way I have suggested, so that we are nearer the attachment of the round ligament to the uterus, that is the place to have it. Nature does not push it up to the anterior abdominal wall. It is said that subsequently the patient will have a lot of bladder symptoms. I have only operated twice by this method, and these patients have not had bladder symptoms. We do this same thing when we perform a hysterectomy, separate the bladder from the uterus, do a supravaginal amputation, and stitch the bladder to the peritoneum on the posterior wall and the stump of the cervix. How many patients have bladder symptoms after doing that?

I am glad the operation I have described has brought out such a free discussion. I desired to obtain the ideas of some of you whether the opera-

tion is of value. I wrote Professor Pestalozzi as to whether he had published the results of this operation. I wrote him six weeks ago, but have not received a reply. I shall follow the operations up and see whether we can find any detailed report of his cases and what the subsequent results are after operation.

Concerning the two cases I have described, I still feel that I shall continue to do more of these operations and follow the cases up and see whether they develop bladder difficulties or not. When I saw this operation performed it struck me as something worth while, and I thought I would present it to you.

NEW YORK ACADEMY OF MEDICINE

SECTION ON OBSTETRICS AND GYNECOLOGY

STATED MEETING, HELD NOVEMBER 28, 1922

DR. WILLIAM P. HEALY IN THE CHAIR

DR. LE ROY BROUN reported a case of **Ovarian Papilloma with Secondary Involvement of the Abdominal Wall 18 Years after Subtotal Hysterectomy for Fibroid with Retention of Adnexa.**

The patient, a married woman, without children, first came under my care in 1904. She was at that time thirty-four years of age. She presented a bleeding fibromyoma reaching to the umbilicus. A subtotal hysterectomy was done, with retention of both ovaries and tubes. The recovery was smooth and athermic.

The patient was not seen again until August of this year, 18 years after the original operation. Up to one year prior to her visit she had been in excellent health. She first noticed a painless lump in the abdominal wall, to the left of the section scar. During the last five months the patient had had occasional nausea and symptoms of indigestion, and the lump above referred to has increased in size. She was well nourished, with firm thick abdominal wall and no evidence of free fluid. The laparotomy scar of the former operation was firm. To the left of the scar was a firm, hard painless tumor three inches in diameter; and apparently developed in the abdominal wall.

Vaginal examination showed an atrophied cervical stump. In the right lateral fornix was a small ovarian cyst the size of a large orange; partly fixed. The left fornix was free. There was no pain elicited. The patient insisted on delay on account of the anticipated marriage of an adopted daughter.

Three months later she again came to the office having developed alarming symptoms. The nausea had increased to the point of inability to retain food. The abdomen had become much distended and mildly sensitive, and the abdominal wall tumor had changed in contour, had lost its hardness and was tender.

The patient entered the hospital after a week's study and preparation, and the abdomen was opened on the diagnosis of malignancy. The free abdominal fluid of over three gallons was emptied. The abdominal wall tumor to the left of the incision was seen to be papillomatous in character involving the parietal peritoneum, the overlying layers and the rectus muscle. A part of the tumor was removed for examination. Immediately underlying this tumor and densely adherent to it were loops of intestines. The ovarian cyst partly filled the true pelvis, and projecting from the cyst wall to the lateral wall of the pelvis were papillomatous masses. No extended examination of the remaining contents of the abdomen was

made on account of the poor condition of the patient. There were, however, no other marked secondary papillomatous deposits.

The papillomatous abdominal wall tumor was evidently a secondary implant from the papillomatous cyst in the pelvis, this implant taking place in the site of the adherent intestines, the location of the greatest irritation.

A week later the patient was given deep x-ray exposures, and has received up to the present, two series of five treatments each. The effect of this treatment has been to decrease the size of the abdominal wall tumor fully two-thirds. The treatment has not decreased the rate of reaccumulation of ascitic fluid.

The fact that the hopeless condition of this patient is unquestionably due to the presence of the conserved ovaries with retrograde changes to a papillomatous malignant growth, brings up the question of the wisdom of at all times conserving adnexa, when apparently healthy, after the removal of the uterus. In this individual patient unquestionably they should have been conserved, since at the time of the original operation she was only thirty-four years old. The trend of the present-day custom is, however, to urge ovarian conservation at all times, whether the patient is near the menopause or past this period, except in cases of malignant disease of the uterus or adnexa. We are influenced to a marked degree by the customs and thoughts of our immediate day. Whether, however, we conserve the ultimate interests of our patients when we preserve the adnexa, about the age of the menopause, at the time of the removal of the uterus is still a doubtful question with me.

Less than ten years ago in the course of a discussion the question was brought up at a meeting of the American Gynecological Society, as to the advisability of removing the adnexa when doing a hysterectomy on a patient about the menopause age. Such opinions were the result of the experience of the operators, in spite of the fact that internal ovarian secretions were just as active at the time of that discussion as they are today, yet we had not had it so constantly put before our mind as it is at present. Four years ago Polak, before the same society, presented a paper on the study of the ultimate behavior of conserved ovaries as taken from a collection of cases from his own clinic. He voiced in this paper in every particular my own convictions that in instances of removal of the uterus the conservation of the ovaries should not be a routine measure, but that each case should be dealt with individually. I venture to predict that in the near future the surgeon will return to his original line of thought and question the endocrine value of conserved ovaries, when at the time of the menopause it is necessary to remove the uterus, the basis being that the patient's interests are better considered when she is certainly left free of a possible pelvic discomfort with the attendant nervous condition if the adnexa are removed at the time of the hysterectomy.

DR. BROUN also reported a case of **Carcinoma of the Cervix Uteri 12 Years after Subtotal Hysterectomy for Double Adnexal Disease in a Nullipara.**

This patient first came under my care in December, 1909, with a history of recurring pain and pelvic distress of nine years' standing. At that time she was forty-eight years of age and had never become pregnant though married for eighteen years. She gave a history of infection extending over eighteen years. There was a large, boggy uterus, and in both lateral fornices thickened tubes and ovaries could be felt imbedded in adhesions. A subtotal hysterectomy was done with removal of both adnexa. Gauze drainage was used through the split cervix and

culdesac, the peritoneum being closed above. The recovery was uneventful. The appendix was also removed.

The patient came again under my care in June, 1921, stating that she had been in excellent health up to a short time previously. She states that for the past four years she has had a leucorrheal discharge which had not existed previously. Her family physician having died, she did not consult any one, attaching no importance to the leucorrhea. For the past three weeks she has been having a bloody discharge.

Examination showed a thickened cervical stump, bleeding easily from the mucous membrane; in one angle there was a thickened, inflamed nodule, bleeding easily to the touch. The broad ligament was perceptibly infiltrated on the left and slightly so on the right. At the time of radium application a part of the thickened involved area was removed for diagnosis. Radium was applied to the canal in 650 mg. hours' dosage, and 300 mg. hours in the form of a needle were inserted in each of the bases of both broad ligaments. The pathologic examination of the specimen removed was that it was not malignant, but showed marked polypoid hyperplasia of the mucous membrane. From the subsequent history and local changes the lesion was carcinomatous and was not excised. The patient died within eight months from exhaustion and suppression of urine.

For fully ten years my rule in hysterectomies is to do a total removal of the uterus in all patients who have borne children. In nulliparous patients I leave the cervix except in instances of endocervicitis. In this instance the origin of the carcinoma was undoubtedly in the scar tissue of the cervical stump following its incision into the culdesac for the purpose of drainage.

I have for years followed this course of splitting the cervical stump into the culdesac when drainage was necessary for the purpose of insuring a patulous drainage canal after removal of the gauze. There have never been up to this time any undesirable sequellae. In the future a total hysterectomy will be done except where inadmissible.

DISCUSSION

DR. H. N. VINEBERG.—The very worst menopause symptoms I have observed were in women who had already reached the menopause. I maintain that if the ovaries are to be retained it is as necessary to retain them at the age of the climacteric as at an earlier age. Personally, I do not think they ought to be retained at any age, but they are just as important at the time of the menopause as earlier. In my opinion the retention of the ovaries without any uterine mucosa so that menstruation may continue, does not lessen, as a rule, the artificial climacteric and the retained ovaries not infrequently give rise to further trouble. Hence it is my practice to do a myomectomy whenever it is at all possible, and conserve the menstrual function.

DR. HEALY.—I take, though with some hesitation, issue with Dr. Vineberg. I believe that in younger women the ovaries should be conserved, but if you are going to conserve them you ought not to remove their blood and nerve supply. I think the ovaries should be removed if you cannot conserve the tubes and the blood and nerve supply. The fact that this one woman developed a cyst of the ovaries left at hysterectomy is not argument for always removing the ovaries when you can leave the tubes with them.

DR. A. J. RONGY.—Notwithstanding this instance of secondary involvement of the stump of the cervix after so-called hysterectomy, I think the greater amount of

safety to the larger number of patients will be secured if we do not attempt to remove the cervix in every case. I believe that the incidence of carcinoma in the stump of the cervix has been estimated at between 2 and 3 per cent. This small percentage would be entirely outweighed by the higher mortality if we should attempt always to remove the cervix. I have seen four cases of secondary involvement of the cervix after hysterectomy in over fifteen years. I think the incidence of large tumors deep in the pelvis is too great to risk endangering the lives of patients by always removing the cervix in these cases.

A point not brought out in the discussion is that in women who have a tendency to high blood pressure at the time of the menopause, this tendency is minimized by leaving the ovaries. The removal of the ovaries seems to have something to do with an increase in the blood pressure at the time of the menopause.

DR. BROUN (closing).—I realize that we can never agree on the question of the conservation of the ovaries, but I feel that it should not be impressed as a routine measure on every operator. I have seen so many who have been impressed with the importance of leaving the ovaries or parts of them irrespective of the case in hand, that they overlook the fact that if the ovaries are left and the tubes are removed the circulation of the ovaries will in all probability be impaired, especially in inflammatory cases. Under these conditions, while the patient recovers she stands a good chance of not being cured on account of pain. Instead of being a conservative measure the conservation of the ovaries has been a radical procedure under such conditions, and the interests of the patient have not been duly considered. Personally, I do not recall any patient who has complained because the ovaries were removed at the time of the menopause, but I have had a number of patients who said they were sorry I had left their ovaries, when they were no longer healthy.

In regard to the second case, twelve years ago we were not considering focal irritation as a cause of cancer and I cut through the cervix and drained the culdesac. I would not do this now with this case in view, because there has been a scar which caused irritation and was the cause of the carcinoma. In my hands following total hysterectomy recovery is just as smooth or a shade smoother than following supravaginal hysterectomy. Where the patient can stand it, it is only what we owe to her to remove the cervix.

DR. HEALY.—I would like to draw attention to one point. In the history of Dr. Broun's second patient, the woman had been married 20 years and for a great many years she had suffered from pelvic infection, presumably of Neisserian type and had extensive lesions of the tubes. This is exactly the type of case in which the cervix should be removed. If we go on the theory that there is anything in traumatic irritation as a source of cancer, certainly the cervix in which there has been chronic disease for many years is the cervix to be removed. As Dr. Rongy has said, it complicates a case a great deal to remove the cervix and these inflammatory cases in which the cervix should be removed are the most difficult in which to do it. We must take into consideration whether the final mortality will be greater in hysterectomy with removal of the cervix or when the cervix is left whether it will be greater from subsequent malignancy. In 18 years I do not believe I have seen 10 cases of cancer of the cervix where supravaginal hysterectomy has been done, so I feel that a diseased cervix should be removed if the patient's condition is good enough to withstand the additional time required to remove it. All cases cannot be treated in that broad way. One must consider the patient's condition at the time of operation rather than a possible carcinoma at some future date.

DR. JAMES C. MASSON, of Rochester, Minn., read by invitation a paper on **Sarcoma of the Uterus.** (For original article see page 345.)

DISCUSSION

DR. JAMES EWING.—Dr. Masson emphasized the different types of sarcoma of the uterus, because from the laboratory standpoint that is the most impressive aspect of this subject. Different types of sarcoma occur in the cervix, parametrium, and endometrium, and in many gradations, all of which I do not pretend to be able to identify.

As a pathologist, I am impressed with Dr. Masson's breadth of information. We pathologists are likely to be limited in our information to the macroscopical and microscopical data obtained from the specimens and do not have the advantage of observing the cases clinically.

In regard to malignant changes in fibromyomata, I have seen only one sarcoma definitely derived from a myoma, and it was concluded that it was a myoma which had undergone sarcomatous degeneration. The gross specimen showed a multilobed myoma, three-fourths of which was myoma and the other one-fourth was entirely different, being edematous, cellular and distinctly malignant. Here we had an old myoma with a single lobe showing secondary changes of sarcomatous character. The sarcomatous portion of this growth was in contact with the endometrium and at this point had ulcerated through and infection had involved practically all the sarcomatous portion in a subacute inflammation. Other cases in which sarcomatous transformation of a myoma has been claimed have given a long history of myoma. In some instances there has been an exploration and a visual demonstration of the myoma, and then some years later there would be another operation and there would be discovered a rapidly growing sarcomatous tumor. There are a few instances of that sort in the literature.

There is another way to look at these sarcomatous myomata, and that is from the standpoint of the location of the tumor. There are certain myomata which one would naturally expect to be malignant; those are the heterotopic ones. Sarcomatous characters exist more frequently in myomata in the broad ligament. I have seen several myomas at a distance from the uterus, as in the cecal region and under the liver, where there may have been displaced wolffian rests, which were malignant from the start. We are all aware of the malignancy of polypoid myomata in children, and in adults polypoid myoma is apt to recur and to be malignant. If the myoma is in the ordinary location in the uterus there are slight chances of its becoming sarcomatous; if, however, it is heterotopic, it is likely to be malignant. Some forms of adenomyoma which are not a sarcomatous structure, are apt to run an unfavorable course because of the unusual attachment, which renders them difficult to extirpate completely.

As to the malignancy, there are other factors in connection with polypoid cervical myomas; they are nearly all incompletely removed, owing to the difficulty of extirpating all the involved tissue in the cervix and the remnant left recurs. These recurrences are apt to be more malignant and aggressive than the original growth.

It is an interesting feature in this report of Dr. Masson's that in 7000 or 8000 operations malignant changes in myomata occurred in rather less than 1 per cent. I think he is quite right in speaking of the unwisdom of attempting to discover every cellular focus and of the mistake of attributing unusual importance to them since this would increase the number of sarcomatous myomata and lead us astray in the interpretation of these cases.

DR. WILLIAM E. STUDDIFORD.—Personally my experience with sarcoma of the uterus is very limited, and I have been wondering whether many cases have been

overlooked in which there has been a sarcomatous change in the fibroid. Some time ago when the question of malignant changes in fibroid tumors was brought up I attempted to go over some material that had accumulated at Bellevue Hospital. At that time there was only one case recorded in which there was malignant change in a fibroid. Dr. Clark of Philadelphia told me that his material had shown very few changes in fibroids which were of a malignant nature, and very few recurrences. The pathologists have said that possibly some cases of malignant change had been overlooked, but few cases had been met in their examination of tumors. Possibly malignant changes might be found if repeated sections had been made.

As a matter of fact, I recall only four cases, one in a child two years old with sarcoma of the uterus, extending practically to the umbilicus, and that child died within a few weeks after the tumor was first discovered; the first symptom was bleeding from the vagina. In a second case a supravaginal hysterectomy had been performed for fibroids and sarcoma was found involving the endometrium. There was a rapid recurrence in the cervix. An attempt was made to enucleate the cervix and the woman died. The third case was one of melanotic sarcoma in a fibroid. Twelve years before she had had an eye removed for melanotic sarcoma. Of course the diagnosis rests entirely upon the microscopic findings and there is nothing in the symptoms to distinguish this condition from carcinoma. The same is true in fibroids.

The question of the possibility of malignant changes brings up the other question of complete as against supravaginal hysterectomy. I have always felt that the safe rule in operating on fibroids is, before the operation is completed, to have someone section the uterus to note whether there are any changes present other than those characteristic of every fibroid. Leaving out the question of malignancy, I think it is best to remove the cervix.

DR. JAMES CORSCADEN.—There are two things in connection with this subject of interest: (1) the frequency of sarcoma with myoma of the uterus and (2) whether there may not be some symptom or group of symptoms that would give a suspicion of the presence of sarcoma. With a mortality of supravaginal hysterectomy of less than 1 per cent, if the incidence of sarcoma with myoma is 1 per cent or more, it seems to me almost logical to do a hysterectomy for every myoma found on examination, and that would mean a large number of hysterectomies, for it is said that four out of ten women have fibromyoma uteri. As to the frequency, I have tried to find out something definite by looking at the statistics up to 1900. J. Riddle Goffe did the first modern hysterectomy in 1886. Bier in 1894 ligated the uterine arteries separately. This did not get into full swing, however, until 1900. Prior to that time these operations were considered very serious and operation for fibromyoma was performed only when the patient was suffering severely. Despite the fact that statistics are not very reliable, for many would call a condition sarcoma while others would call the same condition carcinoma, etc., there are no figures showing any great incidence of sarcoma of the uterus before the modern operation was performed. As to the incidence of sarcoma in cases of myoma treated by radium and x-rays, unless we underestimate the effect from the radium and x-rays, this treatment cannot destroy sarcoma. Twelve hundred milligram-hour doses will cause myomata to shrink. I do not know the effect of radium on known sarcoma. There have been a large number of myomata treated by radium since 1902, and if the incidence of sarcoma is high we should have a large mortality from neglected myomata, yet the only case I have found was Schoomacher's, which the patient was treated for myoma and afterward developed sarcoma. There must be many more such cases. In other words, I am interested from the patient's standpoint in knowing how many myomata, giving the microscopical picture of sarcoma, in time, are

going to kill the patient; that is really what we are trying to find out. In our 800 cases of myoma there have been four sarcomas, two without doubt and two doubtful. Dr. Vineberg referred one little girl whose pelvic viscera were so matted up that a specimen could not be removed. Under x-ray treatment it has practically disappeared. The other case is similar to those Dr. Ewing spoke of, the one with sarcoma of the broad ligament. The other two cases have been seen within the last two months and both had extremely acute histories. The one was forty-eight years of age, the other 52, both, in apparently good health, suddenly became ill and suffered from pressure symptoms and toxemia and high temperature indicating infection. In one there was intrauterine endometrial sarcoma filling the uterine cavity. The growth was composed of round cells not in the neighborhood of smooth muscle, recognized as such. The other growth was around the wall in close approximation to tissue that looked like ordinary myoma.

If one out of every 100 myomata will kill the patient by becoming a sarcoma we ought to forego every form of expectant treatment of myoma.

DR. EMIL SCHWARZ.—We are very fortunate in obtaining, through Dr. Masson, the statistics from one large institution. It might occur that there are discrepancies of opinion as regards malignancy when such tumors of the uterus are examined. The diagnosis seems to depend on the experience of the pathologist and the statistics giving proportions of myoma and sarcoma are often dependent on the locality on which the operations were performed. The fact that more hysterectomies are done on this side of the ocean than on the other side accounts for the varied incidence of sarcoma. The proportion between the benign and malignant stroma tumors is from 1 to 14 per cent, while a ten per cent occurrence is surely exaggerated. All the degrees of differentiation of the muscle cell into entirely undifferentiated round cells are found in these uterine tumors and rarely a doubt arises as regards malignancy although the degree of invasion probably depends on the amount of differentiation. A less differentiated tumor is probably more malignant, the sarcoma of the cervix is histogenetically entirely different from the corpus sarcoma, the origin is distinctly of an embryological character. I should like to mention in connection with the literature the name of Prof. Robert Meyer whose classical monographs on sarcoma of the uterus are outstanding for the excellent histological classification and brilliant scientific speculation. I think that well trained histologists encounter no difficulty in selecting suspicious portions of the tumor and the sectioning of ten or fifteen portions of myomata particularly by the freezing method does not appear warranted from the standpoint of a pathologist. Frozen sections rarely disclose delicate histological changes in tumors.

DR. WILLIAM CRAWFORD WHITE.—At Roosevelt Hospital from 1910 to 1922 there have been 1479 cases of fibromyoma uteri. In that same period we have recognized only two cases of sarcoma of the uterus, one in 1912 and the other in 1919; both were alive in 1922. In regard to what Dr. Masson said about radium and x-ray treatment, I do not see how any one can talk about radium for these cases because we cannot recognize when they are sarcoma in the early stages.

DR. VINEBERG.—I should like to put on record a case similar to the one Dr. Ewing spoke of. This case by all reasonable inferences had a myoma first and a sarcoma developed in the growth. The woman was about 53 years of age. She had a large tumor reaching midway between the unbilicus and the ensiform cartilage. It looked to me at the time as though it was nothing else than a fibroid tumor. The woman was suffering from pressure symptoms and I did a complete hysterectomy. However, in removing the adnexa and the cervix, as it was such a large tumor and there was some ascitic fluid in the peritoneal cavity, I asked the pathologist to examine it very carefully. The pathologist of Mt. Sinai Hospital reported it as a

simple fibromyoma. Six months later the woman returned with an enormous recurrent growth and then the tumor was reexamined and found to contain sarcomatous cells in certain areas.

Another very interesting case was that of a woman operated upon by another surgeon who did a supravaginal hysterectomy for supposed fibroids. The woman came back one year later complaining of pain in both sides of the abdomen and in both lower quadrants. A growth could be made out on both sides. I was not sure whether they were the retained ovaries or a new growth, but learned that the ovaries had been removed. The patient was suffering so very severely that I operated and found retroperitoneal growths lying practically on the deep pelvic vessels. The growths were removed and found to be sarcomas. Six to nine months later the woman returned with recurrent nodules. She was then treated with radium and x-rays and these nodules have disappeared and though she still has the cervix intact, she is entirely free from recurrences. It was ascertained that a further microscopic examination of the uterine growth showed it to contain sarcomatous elements. Another case is one to which Dr. Corscaden referred. This patient was a young girl ten or twelve years of age, operated upon at the French Hospital for appendicitis. It was stated that at the time of the operation a sarcoma of the uterus was detected but was not removed. As the little girl was suffering a great deal of pain and discomfort it was decided to do an exploratory laparotomy. This showed a growth that evidently was in the walls of the uterus. The omentum was extensively adherent to the tumor. An attempt was made to excise the tumor for examination, but the hemorrhage became so profuse that we desisted from further interference and closed the abdomen. That patient has been treated by Dr. Corscaden and there is absolutely no evidence of growth at the present time. The only disconcerting feature at present is that there is a great deal of thickening and induration of the anterior abdominal parietes.

DR. BROUN.—At the Woman's Hospital in 1800 to 1900 consecutive cases, there has been found less than 0.4 of 1 per cent sarcoma.

DR. HEALY.—I think the variability of the incidence of sarcoma in uterine fibroids is very striking. We have been told 0.4 per cent at the Woman's Hospital and Dr. White has stated that at the Roosevelt Hospital among 1500 cases covering a period of 12 years there have been only two cases indentified histologically as probable sarcoma. This indicates that there is a great variability in the type of tissue identified as sarcomatous at different institutions. At Roosevelt we are not in the habit of doing a complete hysterectomy for fibromyoma uteri unless there is some complication requiring drainage of the pelvis into the vagina. So, bearing in mind that a very large number of operations for fibromyoma uteri are done by supravaginal hysterectomy and in many cases the adnexae are left, it is quite possible that sarcoma has been overlooked, and this being the case one would expect to find a small number of local recurrences of sarcoma in the pelvis. We have not discovered such cases in our follow-up work which is fairly accurate and this leads me to believe the findings nearly correct for our group of cases for we have practically seen no cases of sarcoma. If sarcoma has been present it has been encapsulated and has not broken through.

DR. MASSON, (closing).—The points brought out in the discussion are just the ones that have been worrying me in my study of the subject. My attention has not been brought to the 1 per cent of cases in which the growth was outside the uterus. I shall be interested to follow Dr. Ewing's suggestion and to observe whether the greater percentage of maligancies are those separated from the uterus, such as those of the broad or round ligaments.

I believe that in removing myomas we should insist that a pathologist examine the specimen before the operation is completed. Sarcoma cannot be detected from its

gross appearance, therefore, a trained pathologist should examine specimens before the patient leaves the operating table. Unfortunately, the number of trained pathologists is limited, and it is difficult to judge the incidence of sarcoma in fibromyoma from statistics, because those classified as malignant in one hospital are not so classified in another.

I am sure that a great many fibromyomas are removed and the malignancy not recognized. No doubt the spindle-cell type of myosarcoma is a condition much less malignant than the small-cell or oval-cell sarcoma found in the endometrium. I believe myomectomy has saved many lives from malignancy when malignancy was not suspected by the surgeon.

Department of Reviews and Abstracts

Conducted by Hugo Ehrenfest, M.D., Associate Editor

Collective Review

Protein Therapy and Non-Specific Resistance

By Hugo Ehrenfest, M.D., St. Louis, Mo.

WITHIN the comparatively short time of about seven years, nonspecific protein therapy has gained a firm foothold in clinical thought and practice. Well in accord with the generally noted trend of modern gynecology to supplant operative procedures, notably in so far as they imply the removal of organs, with nonoperative and thus truly conserving measures, also the gynecologist has exhibited keen interest in this new type of therapy. Proper appreciation of these recent efforts (reflected in the appended group of Selected Abstracts) presupposes familiarity with the biologic principles underlying this form of treatment. This information can now be readily obtained from a volume on *Protein Therapy and Non-Specific Resistance* by William F. Petersen, which covers the entire problem in a most exhaustive and authoritative manner. From this work I shall quote certain facts which not only elucidate the essential principles of this method but also tend to show that stimulation of nonspecific reaction by the injection of foreign proteins represents a novel and probably valuable addition to the gynecologic therapeutic armamentarium in combating inflammatory processes of the internal genitalia.

The idea of therapy on a nonspecific basis, at first glance, seems a step backward. The study of the causal relation of microorganisms to certain diseases, started by Pasteur and Koch, the long known clinical fact that certain infections lead to the development of specific immunities, and finally therapeutic results with specific sera and vaccines, ushered in by the work of Behring, have led to that specific ideation on which modern medical science is largely founded. Naturally enough in such a period of successful achievement clinical observations that did not fit in with the prevailing mode of thought were but half-heartedly put forward and soon passed into oblivion.

The present interest in nonspecific therapy did not originate on the basis of a convincing theory or promising laboratory experimentation. It was the clinic that forced attention to certain therapeutic results which could neither be ignored nor reconciled with prevailing conceptions of the mechanism of recovery from disease.

In 1893 Fraenkel reported on the treatment of 57 cases of typhoid fever with subcutaneous injections of typhoid bacilli. In an address, delivered at the same time, Rumpf presented a similar series of ty-

phoid patients with equal success treated with a pyocyaneous vaccine. He called attention to the reaction following the injections in the form of chills and sweating and the subsequent euphoria. Published at a time that witnessed the successful introduction of diphtheria and tetanus antitoxin, Rumpf's paper was practically ignored. Approximately at the same time Kuehne had analyzed the tuberculins and noted the large amount of protein split products therein contained. Koch himself was cognizant of the fact that the fever-producing element in the tuberculins was not part of the specific effect which he was seeking to accentuate. Hueppe, Scholl and others insisted that it was just this nonspecific bacterial protein which accounted for the entire tuberculin reaction. These findings and clinical observations finally led to the experiments of Matthes and Krehl (about 1895) with protein split products in tuberculous animals. In employing various proteins they discovered that also milk injections would activate the focus.

To the same period also belongs the reintroduction of the artificial abscess, the sterile fixation abscess (e.g., produced by the injection of turpentine), with apparent success used by Fochier in puerperal infections.

Nucleic acid and its salts were used in a similar manner, and for about two decades extensively employed with seeming success. These injections caused a leucocytic reaction supposedly expressing a favorable general tissue stimulation.

Collodial metals, especially silver preparations, had come into more general use after their introduction by Credé. They first were thought to possess specific streptococcicidal properties, but finally the colloidal metals have come to be recognized as nonspecific, purely reactive agents.

Autoserotherapy, introduced in 1894 by Gilbert for the treatment of pleurisy and consisting in the subcutaneous reinjection of pleuritic exudate, belongs in the same category of therapeusis. The resulting benefit after further investigation was definitely ascribed to the leucocytosis that usually follows the injection.

There are two related measures to be found in tumor therapy, viz., the trypsin treatment of Beard, and the fluid of Coley, supposed to be particularly useful in sarcoma. The injections of both agents are followed by a severe reaction—chill, fever, increased local pain, evidences of inflammatory reaction, occasionally followed by clinical improvement. These reactions are now known as typical nonspecific phenomena.

Another nonspecific method, at times followed by good clincial results, has been that of the injection of leucocytic extracts in patients ill from various infectious diseases. It has been found, e.g., by Opie, that such injections had a very decided protective effect against infections. But also these results probably are to be explained on the basis of a nonspecific reaction.

Between 1890 and 1910 reports began to become more frequent which detailed successes through a number of therapeutic measures, purely nonspecific in character (e.g., normal serum and diphtheria antitoxin in the treatment of tuberculosis, arthritis or cerebrospinal meningitis). This paraspecific serotherapy has been extensively used

in France, and its rationale more recently has been thoroughly discussed by Cumston (New York Med. Jour., 1918, cviii, 903).

Yeast has been employed for many years in the assumption that it augments the resisting powers of the body. Yeast extracts have also been given subcutaneously for the same purpose.

In the group of nonspecific therapy of infectious diseases also belong some of the efforts of administering mixtures of various vaccines.

We thus have a large list of agents employed, some empirically, others on definite immunologic theories, but all, whether bacteriologic products, enzymes or chemicals, producing a more or less marked constitutional reaction. It is curious that this common feature was not emphasized or even recognized as a possible part of the therapeutic mechanism.

Throughout the period under discussion vaccinotherapy as advocated by Wright was being tried out, not always with success, but with sufficient result to keep the method in use. In general, however, the therapeutic results certainly did not measure up to expectation. As a matter of fact it is this work with vaccines which ultimately led to the modern conception of protein therapy and nonspecific resistance. The idea of strict specificity of such vaccines, built up in the laboratory, had to give way to the definite clinical demonstration of the equal effectiveness of heterobacteriotherapy. This marks the real beginning of the recognition of nonspecific therapy. Corroborative clinical evidence quickly appeared from a number of European hospitals in a great number of various diseases.

From heterobacteriotherapy it was but a logical step to the intravenous and subcutaneous injection of bacterial components and bacterial split products, then to protein split products of nonbacterial origin, and finally to the realization that any substance which is capable of inducing the shock reaction on the part of the patient would result in general in the same therapeutic change. Soon a number of other agents were so used, milk, proteoses, albumoses, hypertonic salt solution, etc. Distilled water and foreign sera soon were added, and more recently the ancient method of producing sterile abscesses by the injection of turpentine or hypertonic salt solution has been revived. It was recognized too that some of the older agents, nucleic acid, colloidal metals, enzymes, lipoids, etc., all belonged in the same category. They all brought about a general reaction which manifested itself as a rule in a chill, fever and leucocytosis.

In the nonspecific therapy, as now widely employed, chiefly in European clinics, the following substances seem most often used: ovalbumin, seralbumin, milk, fat-free milk, casein, gelatin, nucleoprotein (plant proteins), and protein split products such as proteoses, deuteroalbumose, histamine, globin and peptone.

Milk and certain special milk products at present seem most favored by gynecologists and, therefore, it will prove interesting to mention here further details concerning their use. The intramuscular injection of milk was introduced by Schmidt and by Saxl in 1916 to induce a protein reaction. Milk offered the great advantage of being always available. Ordinary pasteurized (or fresh) milk is boiled for from five to ten minutes. After having been cooled off, from 5 to 10 c.c. are injected intragluteally, or into the muscles of arm or back.

The injection is followed in some instances by a chill (not so severe as that following a typhoid vaccine injection), and by a rise in temperature that reaches its maximum in from 6 to 8 hours and then subsides within 24 hours. A well marked leucocytosis, ranging from 15 to 40 thousands also results. Milk, so injected, has a decided styptic effect and, as shown by Doellken, is of particular value in diseases associated with hemorrhage. Thrombokinase and fibrinogen appear in increased amounts in the serum after the injection. Locally there may be considerable pain at the site of injection.

It is believed by some investigators that the intensity of the reaction is wholly dependent upon the bacterial contents of the milk. Fresh sterile milk seems to cause less reaction. When milk injections are repeated the reactions may be successively augmented, differing in this respect from the effect of reinjections when bacteria or proteoses are employed. There seems to be little danger of sensitization or of anaphylactic shock from repeated injections of milk. Some later observers are of the opinion that milk preparations (caseosan, etc.) are more apt to be followed by shock symptoms. Other writers assume that such symptoms develop only if inadvertently the injection had been made directly into a vein. It has been suggested to use human milk in preference to cow's milk. For intravenous use a special fat-free milk has been prepared.

Lindig and Mueller attempted to refine the milk therapy by employing purified casein in place of milk. This would represent a chemically constant product, free from bacteria. Thus a standard dosage might be determined. Lindig used one-half to one c.c. of a 5 per cent solution of casein, Mueller in a similar way Aolan, which seems practically identical with another preparation named Caseosan.

It would lead too far to describe here in detail the general and focal reactions and their assumed biologic origin, or present even only a résumé of the claimed results of nonspecific therapy in a great variety of diseases, including gonorrhea and its complications, and other conditions often seen in gynecologic work. The reader is referred for this information to Petersen's book.

Protein therapy with proper dosage, in Petersen's experience, offers a potent, perhaps the most potent, method that we have at our command of altering the current of cellular activity in two diametrically opposite directions—acceleration and depression of function. Treatment under proper dosage results first in a well marked stimulation without clinically apparent fatigue (brought on only by a toxic or too large a dose), and if continued for a period of time this alteration of acceleration and subsequent retardation of metabolic processes becomes clinically manifest in increased weight and general well being.

But as with all new therapeutic procedures there still exists great uncertainty as to the proper dosage. This is especially true for this therapy since the dose to some extent depends on the vigor of the patient, on the type of infection, as well as on the stage of the disease. There is no unanimity as yet whether it is preferable to give one or two fairly large injections or several smaller ones. Whatever method is followed, extreme caution is required. In general it must be kept in mind that the first injections should be given early in the course of the disease; that the individual injection must be given slowly; that

a relatively small dose should be given at the first time, and that care must be taken, if the injections are given intramuscularly, that the agent is not by accident introduced directly into a vein.

The nonspecific method of treatment should under no circumstance be considered as a rival or substitute for the proved specific measures that we have at our command.

The severe reaction likely to follow the injection renders it imperative not to employ this therapy in any patient who does not seem a good clinical risk, or would not seem well able to bear the additional strain of a possible violent reaction. Therapeutic results furthermore cannot be expected when the organism of the patient is no longer capable of responding to stimulation, representing the first phase of the reaction.

Care must be taken to obtain all possible information concerning particular hypersensitiveness on the part of the patient such as a history of serum sickness, asthma, urticaria, angioneurotic edema, or also of epilepsy or other grave nervous instability. In such cases the more active agents must not be used.

Pregnancy must be similarly regarded as an absolute contraindication. Great caution will have to be observed in most cardiac lesions, and especially in the presence of signs of incompensation. Diabetics by most writers are pronounced as unfit subjects for this newer therapy.

Nonspecific therapy actually requires more judgment, more careful attention and bedside study than almost any other therapeutic procedure. It should never be a routine procedure.

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Selected Abstracts

Protein Therapy in Obstetrics and Gynecology

v. Jaschke: Experiences with Protein-body Therapy in Obstetrics and Gynecology. Therapeutische Halbmonatshefte, 1921, xxxv, 539.

The parenteral administration of foreign proteins has been employed only recently as a therapeutic measure in obstetrics and gynecology. Excellent results have, however, been obtained by the use of soluble casein (Caseosan-Heyden) in puerperal fever, parametritides, and especially in peritoneal and genital tuberculosis. It appears that the good results are due, not entirely to the hyperleucocytosis, for in certain cases this did not appear, but rather to an activation of protoplasm, an increased functional capacity of the most varying systems of organs. This effect is, however, only obtained with proper dosage, otherwise there may even be induced a state of "proteinogenous cachexia."

Specific antibodies are produced in the body by the Caseosan-injections, and may be demonstrated by the technic of Salomon. The antibody titre should be determined before treatment, and where any considerable amount is present the

initial dose of Caseosan should be small, (0.1-0.5 c.c.) and is better administered intramuscularly than intravenously. Where the antibody content of the serum before treatment is low, an initial dose of 0.5 c.c. intravenously may be given. The therapy is usually far more efficient in the cases where the initial antibody content is low.

Better results are obtained in the chronic infections, especially the tuberculous infections in which often marvelous therapeutic effects are obtained. In the acute puerperal conditions the beneficial effects usually appear too late to save the life of the patient, though occasionally even severe cases of bacteremia have been healed. Other indications for its use are nonpuerperal parametritis, pelvic inflammatory disease, and carcinoma, in the operable cases before operation, to increase the general resistance, in inoperable cases as an adjunct to radiotherapy.

MARGARET SCHULZE.

Gellhorn: The Treatment of Pelvic Infections by Injections of Milk. Journal Missouri State Medical Association, 1922, xix, 341.

While admitting its limitations, Gellhorn is quite well pleased with his results in the treatment of pelvic infections by the injection of sterile milk. He believes that in the majority of cases a cure can be effected without pain, risk, or mutilation where formerly only serious operations gave promise of relief.

From personal observations as well as a study of the literature, Gellhorn gains the impression that the tubes, the uterus, and possibly the bladder are most favorably influenced by foreign protein therapy. The ovaries seem to remain refractory. Of infections, he believes that gonorrheal foci offer a more favorable prognosis, although other infections also respond in some instances. Since gonorrheal infection of the cervix is not influenced, this ought to be treated independently to avoid reinfections.

While milk is not the only protein which may be used, Gellhorn prefers it because it is readily procurable and inexpensive. He uses ordinary whole milk which is sterilized either by boiling in a water-bath for 10 minutes or, preferably, by pasteurizing at 80° C. for an hour on six successive days. From 5 to 10 c.c. is injected into the gluteal musculature and the injection repeated every three to five days until from 4 to 12 injections have been given. The reaction occurs after from 6 to 8 hours, the fever ranging from 100° to 104°.

R. E. WOBUS.

Nussbaum: Stimulation (Schwellenreiz) Therapy in the Treatment of Febrile Abortion. Zentralblatt für Gynäkologie, 1922, xlvi, 424.

The importance of the treatment of abortion has markedly increased in Germany since the war, inasmuch as approximately 87 per cent of pregnancies have ended in abortion and 78 per cent of these are provoked abortions. The mortality from abortions has risen since the war from 3000 to 5000.

The problem of abortion is not only a medical but a national question, and the treatment is of the utmost importance. There seems no common ground for the believers either in active or in conservative therapy. Indeed, therapy is almost useless when the infective process has passed the uterus itself, and here so many suggestions are made as to treatment that it is doubtful whether any are of value. Von Jaschke, after a survey of the literature, came to the conclusion that there could be no standard of treatment, and the propriety of any measure could be judged only by its success or failure in any given case. He believed that the bacteriologic examination was of little value, and recommended active therapy (emptying the uterus) in every case.

The German scientific world is divided into two camps, and each seems satisfied that the other has nothing better to offer in the way of results. Nussbaum asks, is it possible to decrease the mortality?

Up till now the clinical appearance and the bacteriologic invader have been looked upon as the only factors in the prognosis. He would consider the question of fever as important from the biological standpoint, and quotes Walthard to the effect that the most important factors in the question of puerperal fever today are the antibodies in the blood and tissue fluids. Fever is the measure of the relationship between the individual and bacteria. Fever is not a disease, but only a symptom—a factor in the process of immunity, and treatment should be directed to stimulate this reaction process.

The activation of protoplasm was for a long time attempted by means of the injection of inorganic salts, such as those of silver and gold. It is known that leucocytosis, activation of protoplasm, and fever are the results of a similar process.

Nussbaum analyses 1122 abortions on the basis of fever, the most important of the three factors noted above, and would make fever an important factor in prognosis. He suggests (1) that general treatment must begin with the first sign of elevation of temperature; and (2) that, after two and a half days of conservative local treatment, the uterus should be emptied regardless of the temperature. To the injection of an activating substance there are three reactions—local, focal, and general. The focal reaction is the one of importance in estimating the value of treatment, inasmuch as there should be little or slight local reaction at the point of injection, no depressing general reaction, and only a focal reaction. The agent employed should be sterilized and nonpoisonous, and not an uncontrollable mixture (milk). The ideal agent is Jatren-Kasein.

With the injection of this agent the most valuable clinical control is the temperature. If the fever falls after the injection, the individual, activated to a maximum, is in control of the infection. If the fever rises after the injection, the maximum dose has not been given. If it continues to rise after several injections, resistance cannot be increased. The longer the fever persists, the more the individual is weakened in reaction activity, and so focal reaction will be apparent with smaller dosage. The shorter the fever, the higher the activity, and therefore a greater dose should be given in order to reach the maximum in this period. The earlier the injection—best in the rise of fever—the more quickly is resistance increased and infection overcome.

In brief, treatment has been divided into two categories—the active, where the uterus is emptied at once, and the passive, where in the presence of hemolytic streptococci nothing is done, with the possible middle course of passivity for two and one-half days in the case of hemolytic streptococci, in the hope that in this time the fever will disappear.

Nussbaum, in his analysis of 1122 cases, has discovered that cases febrile for two and one-half days before and after emptying the uterus have a doubtful prognosis, and believes that treatment should begin immediately with the onset of fever. Based on the Bier-Zimmer activation therapy, he has used Jatren-Kasein with remarkable results in his cases. The standard of focal reaction he finds in the temperature curve, as noted above. He recommends in fever lasting more than two and one-half days, 2 cm. Jatren-Kasein every second day until the temperature falls, and then every second day 1 cm. until the temperature is normal. With fever of less than two and one-half days' duration, 5 cm. of Jatren-Kasein are injected and then every second day 2 cm. until the temperature is normal.

H. M. LITTLE.

Simon: Protein Therapy in Febrile Abortions. Zentralblatt für Gynäkologie, 1922, xliv, 1837.

Simon recommends protein therapy with albusol. He has worked out the optimal dose by means of the leucocyte count and proved that it was without danger from anaphylaxis when repeated. Thirty febrile abortions, of these 19 with fever over 38.4° C., were treated. Only two had more than two days of fever after the injection; in eleven others where the fever had already lasted four days, three only had more than five days of fever. Twenty-six cases of puerperal infection were treated with albusol; the results in this group were extremely satisfactory. H. M. LITTLE.

Weinzierl: Experiences with Casein Therapy. Deutsche Medizinische Wochenschrift, 1921, xlvii, 1120.

Intragluteal injections of sterile milk were used at the University of Prague in cases of adnexal inflammation of gonorrheal or undetermined origin. The results were disappointing for, although there was an exacerbation of the inflammatory process with accompanying fever and pain as well as local reaction up to abscess formation at the site of injection, the therapeutic results were very slight. Thereupon a commercial preparation of casein under the name of Caseosan was given an extensive trial. Again the therapeutic results were, on the whole, negligible. In 10 cases of puerperal fever of a milder type, Weinzier is of the opinion that certain beneficial results were achieved. In 4 cases of real puerperal sepsis the result was practically nil, three of the four patients dying.

R. E. WOBUS.

Sklarz, E., and Massur, Fr. W.: Paralysis of Accommodation after Injection of Caseosan. Medizinische Klinik, 1921, xvii, 346.

They observed a case in which intravenous injection of Caseosan (0.5 c.c.) gave a very severe general reaction, (temperature 40.5° C.). Four days later the patient was given 1.0 c.c. of the same drug intravenously without any general reaction. Within a short time there appeared a bilateral paralysis of accommodation, which persisted for eight days and finally disappeared spontaneously.

E. D. PLASS.

Stegeman, H.: Treatment of Pelveo-Peritonitic Adnextumors of Puerperal and Nonpuerperal Origin with Injections of Turpentine or Milk. Inaugural Dissertation, Kiel, 1920.

This monograph considers exhaustively the entire problem. Outside of a thorough study of the literature on the subject the writer presents a careful analysis of 100 patients treated in the Frauenklinik in Kiel, 70 of them with injections of turpentine, 30 of milk. As a whole, reactions—both general and local—were less pronounced with turpentine, the milk cases developing fever more often. In comparing certain commercial products like *Terpichin* or *Novoterpen* with turpentine, or, on the other hand, *Aelan* or *Caseosan* with simple milk, he was unable to establish any advantage of the commercial products. With turpentine 18.5 per cent of the 70 cases were cured, 37.2 per cent improved, leaving 44.3 per cent of total failures. The results with milk were: 20.5 per cent cured, 50 per cent improved, 30 per cent failures. In comparing these results with those obtained by Giesecke with diathermy in afebrile adnexal inflammations (in 220 cases: 54.6 per cent cured, 39.1 per cent improved, only 6.3 per

cent failures) the author is compelled to conclude that in the afebrile cases diathermy should be the method of choice.

In spite of these results the author will not deny certain advantages of this newer mode of treatment. (1) It is easier to keep the acute and subacute cases in bed at least while the injections are given. (2) General condition tends to improve and pain to subside. (3) Temperature may be lowered. (4) Reaction may give a clue in the differential diagnosis between an inflammatory mass and a neoplasm. (5) The injections have a good suggestive effect. HUGO EHRENFEST.

Sonnenfeld: The Treatment of the Adnexa with Turpentine or Caseosan. Zentralblatt für Gynäkologie, 1921, xlv, 686.

The method is an extraordinary advance in the treatment of inflammatory tumors of the adnexa. The advantage is that it causes the least trouble to the patient, and gives the most prompt results. He gave injections every second day. Referring to the work of Brewitt Sonnenfeld suggests six to eight injections of turpentine prior to operation for pyosalpinx. Terpichin he considers better than turpentine and both better than Caseosan. H. M. LITTLE.

Bochenski, K: Colloids and Non-Specific Proteins in Gynecology and Obstetrics. Polska Gazeta Lekarska, 1922, i, 542 and Journal American Medical Association, 1922, lxxix, 1808.

There is not much difference in action between different colloids and the non-specific proteids commonly used. Local and general reactions depend more on the constitutional condition of the patient than on the substance used. In general milder cases reacted very favorably, graver, much less. He recommends early use of colloidal and protein injections in puerperal infections, perimetritis and parametritis, acute, subacute, and chronic inflammatory processes of the adnexa. The substances used were silver salts, milk and turpentine, the last in 1 c.c. doses of 15 per cent oil of turpentine solution. Most of the injections were given intramuscularly. The author warns also that the good effects frequently were only temporary, and this indicates that surgical measures should not be neglected or delayed.

Seelmann: Treatment of Adnexal Disease with Turpentine. Zentralblatt für Gynäkologie, 1921, xlv, 1221.

From January 1, 1920, to May, 1921, 200 cases of salpingitis were treated by the injection of 1 cm. of 20 per cent turpentine oil in the gluteal region. There was pain which lasted three or four days, but the patients voluntarily returned for the treatment. Seelmann contended that turpentine brought on a focal reaction with subsequent fever and leucocytosis up to 30,000. His results were favorable, the time of treatment was shortened, the pain was lessened, and the tumors decreased in size. The subacute cases often gave the most marked reactions. The treatment is contraindicated in tuberculous conditions. It is particularly advantageous in gonorrheal infections. Heart disease and pulmonary tuberculosis would appear to be contraindications to the treatment. The treatment of adnexal disease in the puerperium is inadvisable as it is liable to produce vomiting in the child, although the repeated examination of the milk fails to reveal the presence of turpentine. H. M. LITTLE.

Baum, Friederich: Injections of Turpentine in Inflammation of Adnexa. Medizinische Klinik, 1921, xvii, 376.

Baum used the following mixture: Ol. therebint. 4.0, Eucupin 0.2, Ol. olivarum 16.0.

He injected 0.5 cm. every four days into the buttocks, never more than 12 injections in a series. No abscess formation was noted.

The distribution of the cases and the results of treatment are as follows:

I. *Uncomplicated pyosalpinx*—27; (1) Recent process—21: cured—15, improved—2, incompletely treated—4. (2) Chronic process—6: cured—3, improved—3.

II. *Pyosalpinx with exudate*—51; (1) Recent process—36: cured—16, improved—15, unimproved—4, incompletely treated—2. (2) Chronic cases—14: cured—3, improved—5, unimproved—3, incompletely treated—3.

III. *Parametritic exudate*—13; (1) Recent—11: cured—9, not cured—2. (2) Chronic cases—2: well absorbed—2.

IV. *Slight adnexal inflammation*—8; (1) Recent cases—5: cured—5. (2) Chronic cases—3: cured—1, improved—2. E. D. PLASS.

Nystroem, Bruno: Treatment of Inflammatory Conditions of the Uterine Adnexa with Turpentine Injections. Finska Laekaresaellskapets Handlingar, 1922, lxiv, 575.

The writer records the results obtained with this form of treatment in 39 acute and 24 chronic cases of adnexal inflammation. He is convinced that in a large number of the cases the treatment hastened recovery. This holds true in particular for the acute and subacute cases, and especially for perimetritis and parametritis. A favorable effect, however, could also be noticed in the chronic conditions.

Nevertheless he is not willing to subscribe to the very enthusiastic reports that have come from a few clinics as regards the effect of this treatment in the acute cases. In the monotony of the old customary form of therapy, wearing on patient and physician, it is satisfactory to know that this newer method will never do harm if properly applied, but at least in some instances will hasten the resorption of exudates and thus help to improve more speedily the general condition of the patient. AUTHOR'S ABSTRACT.

Hellendall: The Treatment of Inflammatory Disease of the Adnexa by Means of Turpentine Injections. Zentralblatt für Gynäkologie, 1921, xlv, 1864.

This writer has no satisfaction with turpentine or terpichin and believes that the injections were without any effect. H. M. LITTLE.

Kronenberg: Turpentine Injection in Inflammatory Disease of the Adnexa. Zentralblatt für Gynäkologie, 1921, xlv, 257.

He claims that turpentine has no effect on the kidneys. There was a mild rise of temperature after one-quarter to one-third of the injections. Improvement in the general condition was observed only in a few cases. No abscesses developed at the point of injection; pain is infrequent. His results from this local inoculation of turpentine were as follows: In by far the majority of cases there was no effect on the general condition. There was no shortening of the time of treatment in adnexal condition. No ill effects from the procedure were seen. Usually a leucocytosis developed where the blood count had previously been normal. Where there was a leucocytosis the injections caused it to decrease, followed later again by increased leucocytosis. H. M. LITTLE.

Gauss: Results of Intravenous Therapy in Uncomplicated Gonorrhea in the Female. Zentralblatt für Gynäkologie, 1922, xlvi, 977.

Repeated admission of infected women, who had been discharged as cured, made it probable, that in such women there persisted a latent gonorrhea difficult to diagnose. The technic was improved and many more gonococci were found than previously. Instead of the typical microscopic picture of intracellular groups of gonococci, in them frequently single gram negative diplococci, these often extracellular, were found.

It was evident that local treatment was in no way satisfactory, and extremely deceptive as regards apparent cure. The results with vaccines and certain chemicals given hypodermically had been particularly good in inclosed gonorrhea (epididymitis, arthritis, pyosalpinx, pyovarium), but there was very little known about their effect in infections of open mucous surfaces. Gauss determined to determine this point and to see whether results could not be improved, by using intravenous in place of the intramuscular applications, the latter allowing more exact dosage. About eight to ten injections were usually given, and then the effect controlled. About 135 women suffering from uncomplicated gonorrhea were treated and studied.

1. *Vaccine therapy.* Arthigon was tried first, but owing to the large quantity required, it was not suitable for intravenous injections. Next gonargin was used. Of 52 cases, 73 per cent were cured, of the acute cases 56.3, of subacute 78.2, and of chronic cases 84.6 per cent. It was obvious that the previous belief that uncomplicated open mucous membranous gonorrhea did not react was incorrect, and secondly that cure could be accomplished in a great proportion of cases.

Gonotropin was tried in 7 cases, successfully in 57.1 per cent. Some six cases were treated with autogenous vaccine, satisfactorily in about half. This again was contrary to common opinion.

2. *Chemical therapeutics.* Forty-three cases were treated with intravenous injection of collargol, 65.5 per cent satisfactorily. There was no accessory local treatment. The combination of silver and copper supplied by Merck was tried in several cases and found to markedly influence the progress of the disease. A gold preparation, chrysolgan, together with intramuscular application of salicylate of mercury, was tried in some 20 cases, 50 per cent of which were apparently cured.

So far as results were concerned all of these treatments seemed more or less on a par, and all the results were good, inversely accordingly as the diseases were acute, subacute, or chronic. The duration of treatment varied from five weeks with gold mercury to two weeks with collargol, an average of six or seven weeks. Only autovaccine was apparently free from distressing complications. With the other methods there was more or less severe headache and fever, which was remarkably so with the use of collargol. Also with collargol there was evidence of kidney inflammation after the injections. Perivascular inflammatory reaction was fairly frequent. The gold preparation was followed in three cases by unpleasant toxic symptoms.

Gonotropin would seem to be the most satisfactory form of treatment. Most important seems the fact that autogenous vaccine has a place in the treatment of uncomplicated open mucous membranous gonorrhea. Its effect is due not to a specific immunization but to a more or less general protein immunization. The action of the metallic salts is so indefinite that Gauss was forced to conclude that the result in some cases was due to spontaneous healing. Experiments with ordinary salt solution showed that the disease improved markedly. Salt solution and even distilled water gave similar results as the injection of protein bodies. Gauss believed that this was due to the precipitation of protein from the body fluids and the alteration in their concentration with resultant general stimulation of the body reaction. Whether this is called protein therapy, activation of proteoplasma, unspecific stimulation, or curative inflammatory reaction, is of comparatively little importance.

H. M. LITTLE.

Book Reviews

X-Ray Dosage in Treatment and Radiography. By WILLIAM DANIEL WITHERBEE, M.D., and JOHN REMER, M.D. The McMillan Co., New York, 1922. Price $1.75.

This is a little pocket manual of 118 pages designed for every class of practitioner including the specialist.

X-ray dosage, unfiltered and filtered and x-ray burns are discussed in the first 40 pages. The remainder of the book is devoted to the treatment of focal infections of the tonsils, tonsils and adenoids associated with exophthalmic goitre and tuberculous glands, and the treatment of skin diseases.

We trust that no practitioner will venture to practice radiotherapy based solely upon the slender guidance of this well written compend.

R. T. FRANK.

Diseases of Women. By HARRY STURGEON CROSSEN, M.D., F.A.C.S. Fifth Edition Revised and Enlarged. With 934 engravings, including one color plate. Large Octavo, pages 1005, St. Louis, C. V. Mosby Co. Price $10.00.

Crossen's is, on the whole, a most satisfactory book because it not only covers the subject of diseases of women adequately, but also completely and thoroughly. Nothing is taken for granted. If one desires to look up new procedures, as for example the Rubin test for determining the patency of the fallopian tubes, a complete description, making further search of the literature unnecessary, is found within its pages. The introductory chapters alone cover 238 pages. In a fifth edition of a book as well known as Crossen's it is unnecessary to give a detailed description of the contents. Not only are all the diseases of the female pelvic organs taken up, but as has become more and more the fashion, the glands of internal secretion are given a chapter (Ehrenfest), other organs are considered in their relation to gynecology, and medicolegal points are touched upon. The text throughout retains its clearness. The careful paragraphing of the previous editions remains in evidence. Sometimes the overpainstaking arrangement becomes a bit wearisome, but this fault is compensated for by the ease of reference.

A large number of unusually good photomicrographs of pathological conditions are worthy of special commendation (O. H. Schwarz and R. E. Wobus). The illustrations of gross conditions, as in previous editions, are partly culled from a great variety of sources, partly taken from photographs of the author's material and partly drawn by Jones and Summers, consequently great unevenness exists, some being excellent, others distinctly mediocre. Figures 55, 370, 505 might well be omitted or replaced by better illustrations. The reviewer suggests that Fig. 589 be credited to Bumm, instead of Williams. Fig. 528 represents any hyperkeratosis and is in no way characteristic of syphilis.

The stand taken by Crossen on most moot questions is most laudable. He is a firm advocate, as are most of the fully trained gynecologists, of specimen excision and diagnostic curettage. He classifies the suddenly rediscovered risk of cutting

through a suspect area as a phobia and hysteria "due largely to certain leaders in the profession who have permitted themselves to make loose statements too sweeping in character or so ambiguous in construction as to promote erroneous interpretation." With this view the reviewer is in heartiest accord.

Much to our surprise x-ray is advocated for the sexual hyperesthesia of nymphomania. In our experience this aberration has largely proved psychical and uninfluenced by ablation or atrophy of the ovaries. Intrauterine irrigation for acute endometritis is not in accord with modern teaching. The operation for cystocele, as described and illustrated is not satisfactory. We are sorry to see the curve of v. Ott, long since discredited, crop up again.

The reviewer knows of no text book which is so equally suitable for the student and for the practitioner, as Crossen's. Simplicity combined with thoroughness and consistent method are responsible for this flexibility. In spite of its encyclopedic contents the book contains only 1005 pages.

ROBERT T. FRANK.

The Healthy Child from Two to Seven, a Handbook for Parents, Nurses and Workers for Child Welfare Containing the Fundamental Principles of Nutrition and Physical Care, including Sections on Child Nature, Training and Education and Safeguarding the Nervous System during Preschool Years. By FRANCIS HAMILTON MACCARTHY, M.D. 234 pages, The MacMillan Co., New York, 1922. Price $1.50.

The lengthy title sufficiently covers the contents of this little guide which is pleasantly written. Some parents may consider the text a bit too vague to be readily applied to practical problems. In the homely parlance of the day more "pep" would add to the value of this book, and perhaps enable it to compete with some of the popular children's guides which are presented to expectant mothers when they purchase three dozen or more diapers from some of our department stores.

R. T. FRANK.

Le Problème du Cancer. By WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., C.M., L.L.D. Traduit de l'anglais par le Dr. Hertoghe d'Anvers. Louvain et Paris, A. Uystpruyst and O. Doin, 1922.

The interest, to the American reader, in this book is mainly sentimental, as it is a translation of the English edition published by the MacMillan Co., but is the first book to appear from the reconstructed press of the University of Louvain. The translation is fluent, the typography good, but the paper is poor.

ROBERT T. FRANK.

A Manual of Obstetrical Nursing, prepared for use in connection with Text Books of Obstetrics. By NANCY E. CADMUS, R.N. 100 pages. G. P. Putnam Sons, New York and London, 1922. Price $1.50.

This is a skeleton outline to be used for instruction of nurses. It contains five parts—class work, lectures, quizzes, practical demonstrations in obstetrical nursing and maternity nurse visiting.

R. T. FRANK.